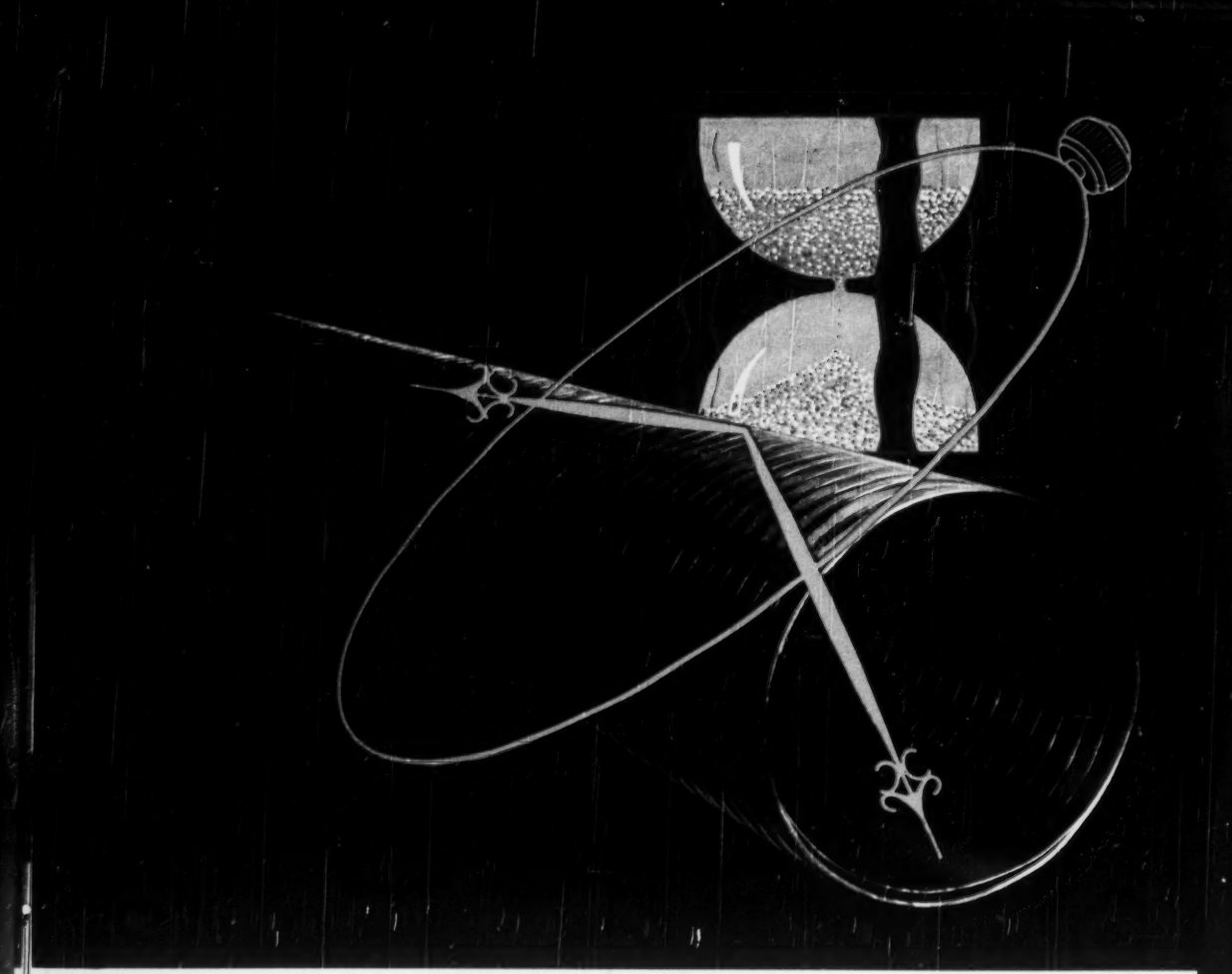
ENGINEERING NEWS-RECORD

SEVENTY-SIXTH YEAR OF PUBLICATION

★ PORTLAND CEMENT FOR NEW ROADS

★ [illegible] HAS SOLVED HIGHWAY NEED

A McGRAW-HILL PUBLICATION



The bottom is "Tops" in this drainage structure

It used to be that drainage structures often had to be replaced even though the upper three-fourths was still in good condition. Engineers and officials wanted to do something about this waste, but what?

Then Armco engineers found the answer in "balanced design." They developed Armco Paved Invert Pipe. This new pipe had a thick bituminous pavement in the invert for greater protection against erosion. Now the bottom lasts as long as the top—service life is up, maintenance down, and everybody's happy.

Creating better products to meet specific needs has been the objective at Armco for something like years. A few examples are Hel-Cor Perforated Pipe, Stress-Proof Bubbleup, Flex-Beam Guardrail, Pipe Arch, and Sturdi-Shield Metal Plate Bridges.

Today you can bring your planning and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities and a real interest in helping you solve your most difficult problems.

Armco has a complete range of engineered products and convenient, authoritative data to help you. If your problem is unusual, why not talk it over with an Armco engineer?

ARMCO

ARMCO DRAINAGE & METAL PRODUCTS, INC.

MIDDLETOWN, OHIO • OFFICES AND PLANTS IN PRINCIPAL CITIES

SUBSIDIARY OF ARMCO STEEL CORPORATION

Berkeley, California ★ Middletown, Ohio ★ South Bend, Indiana ★ Baltimore, Maryland
Denver, Colo. ★ Des Moines, Iowa ★ Atlanta, Ga. ★ Topeka, Kansas ★ Houston, Texas
Minneapolis, Minnesota ★ Portland, Oregon ★ Washington, D. C. ★ Guelph, Ontario

B.F.Goodrich

BFG users report: Continued savings —thanks to double bruise protection

B. F. GOODRICH *Universals* were reported by one operator to be in good condition after daily quarry service for over 21 months. Another operator reports over 4800 service hours from Universals against only 1600 hours from another make in identical service. Still another report told of tires that were still "young" at 8200 hours and probably good for thousands more. These actual user reports spotlight the great difference between various makes of off-the-road tires.

When *results* are measured, BFG tires always stand high. There are many reasons for the continuing top performance of B. F. Goodrich tires. For example, notice the tread on the Universals in the picture above. It's designed to give traction both ways. More than that, it is made of specially compounded rubber . . . armor against sharp rocks and other tire killers.

Also, BFG tires have double bruise protection in the form of a *double nylon shock shield* . . . layers of nylon cord built between the tread and the body plies. Under impact, the strong, elastic nylon shields the cord body. And there are two shields for double protection!

Only B. F. Goodrich gives you the added protection of the nylon shock shield; the added savings from (1) longer tire life (2) increased bruise resistance (3) less danger of tread separation (4) more recappable tires. Nylon shock shield costs no extra—you pay no premium.

There's a specially designed *BFG off-the-road tire for every need. See your B. F. Goodrich dealer or call *The B. F. Goodrich Company, Akron, Ohio.*

*Typical example: New ALL-NYLON tire for tractor-traction projects, quarry work, crop mining, etc. In addition to a single tire (shown), not one but two nylon shock shields.

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way

THE COMPLETE WELLPOINT IS SELF JETTING

"Complete's" patented wellpoints give you compactness, simplicity, lightness and Strength. Keep wet work bone dry when other methods fail. Write or wire for estimates, and engineering consultation. Don't Gamble with costly water hazards . . . get "COMPLETE" and get *results!*

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FOR SALE OR RENT

ENGINEERING NEWS-RECORD

Volume 144 JUNE 22, 1950 No. 25

WALDO G. BOWMAN
Editor

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June 22, 1950 ENGINEERING NEWS-RECORD Vol. 144—No. 25

Publication Office ... Executive and Editorial Offices ...

IF YOU HAVE A REAL ROCK SHOVEL you are equipped for output in any pit!
The Northwest Dual Independent Crowd utilizes force that every other independent crowd wastes! The Cushion Clutch eliminates the effects of shock overloads to parts under power and helps make ample power safer. The Northwest Welded Boom and Dipper Sticks have been proved in Rock work and are built for the hardest job a shovel has to do. Cast Steel Machinery Bases and Cast Steel Machinery Side-Frames take the shocks of rock digging and maintain shaft alignment.
It's a real Rock Shovel and if you have a Real Rock Shovel you never have to worry about output at the heart of the job.
NORTHWEST ENGINEERING COMPANY
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only the best for the heart of the job
MAKE YOUR KEY MACHINE A REAL ROCK SHOVEL
PROFIT
NORTHWEST
CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Announcing the NEW

JENKINS SWINGTITE

with an exclusive new design that assures smooth action, positive closure, and longer life

In the new Jenkins SWINGTITE Fast-Action Bronze Gate Valve, the exclusive rolling disc and guide track design lengthens valve life and assures maximum tightness as it prevents uneven wear of seating surfaces. As the valve is opened or closed, guide rims around the seating surfaces of discs roll freely over guide tracks cast in the body, distributing wear evenly, dislodging foreign matter, and providing a polishing action for seating surfaces.

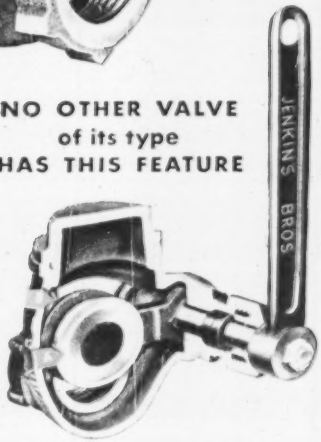
The SWINGTITE can be opened or closed instantaneously and easily with less than a quarter turn of the malleable iron lever which activates the self-adjusting ball and socket type double disc.

Wherever full, free flow is essential . . . where valve opening or closing must be instantaneous . . . you will see more and more Jenkins SWINGTITE Bronze Gate Valves setting new standards of performance and endurance. They are recommended especially for such services as laundry machinery, dish-washing equipment, gasoline and fuel oil lines, fire extinguishing steam lines in kitchens, and dispensing lines to tanks or vats.

Get all the facts on the new Jenkins SWINGTITE. Find out how much smoother-operating, how much *longer-lasting* these fast-action Bronze Gate Valves can be when *Jenkins* builds them. Send for the new folder, Form No. 196, containing full details. Jenkins Bros., 100 Park Avenue, New York 17, N.Y.; Jenkins Bros., Ltd., Montreal.

Sold through leading Industrial Distributors

NO OTHER VALVE of its type HAS THIS FEATURE



Notice the guide rims (A) of the discs which rotate freely on the guide tracks (B) cast in the body, as the valve opens or closes. This roller action provides a self-cleaning and polishing effect, and also distributes the wear, since the seating position of the discs changes with each closing. Rapid, uneven wear is prevented, and continuous tight closure assured.

JENKINS VALVES

NOW

A Tractor-Mounted All-Hydraulic Backhoe!

Here's a great new profit-making tool for contractors, cities, public utilities and towns. The New Oliver-Ware Hydro-Trencher is an all-hydraulic backhoe mounted on Oliver Industrial "77" or "88" Tractors. It's a smooth-acting, simply operated unit that will do a job comparable to much higher priced conventional backhoes . . . outperform many!

Note these profit-making features:

SIMPLE OPERATION. Smooth, finger-tip control hydraulic operation eliminates operator fatigue. Any man can operate this machine immediately . . . specially trained operators are not required.

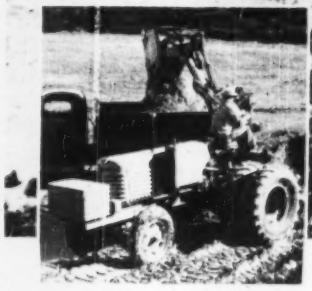
SAFETY. No cables to break . . . no slipping brakes. Safety feature in hydraulic system reduces wear and tear on engine. Engine speed seldom has to go beyond idling.

COMPACTNESS. Unit can work in areas where truck and crawler mounted units cannot work.

MOBILITY. Tractor-mounted unit moves easily and quickly from job to job under its own power and is ready to dig on arrival.

STABILITY. Individually controlled hydraulic outriggers allow operation from a level position . . . hold tractor in place.

VERSATILITY. Digs in any kind of ground . . . over 10 feet deep at speeds comparable to any conventional backhoe. Hydraulic controls give boom down pressure for fast digging . . . a full bucket every time.



A Swing Loader Bucket Attachment is available for use with the Oliver-Ware Hydro-Trencher and can be installed in a few minutes.

For the complete story on this new, profit-making unit, mail the coupon.

THE OLIVER CORPORATION,
Industrial Division
19300 Euclid Ave., Cleveland 17, Ohio

Gentlemen:
Send me the facts on the new Oliver-Ware Hydro-Trencher.

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Company.....

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City.....*State*.....

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Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

A complete line of Industrial Wheel and Crawler Tractors

ASSURE *DEPENDABLE* OPERATION AT *LOWER COST*

TEXACO

TEXACO

Use the TEXACO air compressor oil recommended for your operating conditions

No *ONE* oil can lubricate satisfactorily under all the conditions of air compressor operation. So Texaco has developed *a complete line* of air compressor oils. When used as recommended, you can be sure of dependable, top-efficiency operation and lower maintenance costs regardless of the type of compressor or the operating conditions.

Your Texaco Lubrication Engineer, for example, will recommend Texaco straight mineral oils for normal conditions . . . Texaco inhibited oils for rust prevention . . . Texaco special heavy-duty oils where service is severe and carbon and gum formations are problems . . . and Texaco compounded oils if excess moisture is present.

Thus, use of the *right* Texaco air compressor oil assures free rings . . . clean valves and clear air lines . . . reduced wear for all moving parts . . . lower costs all around.

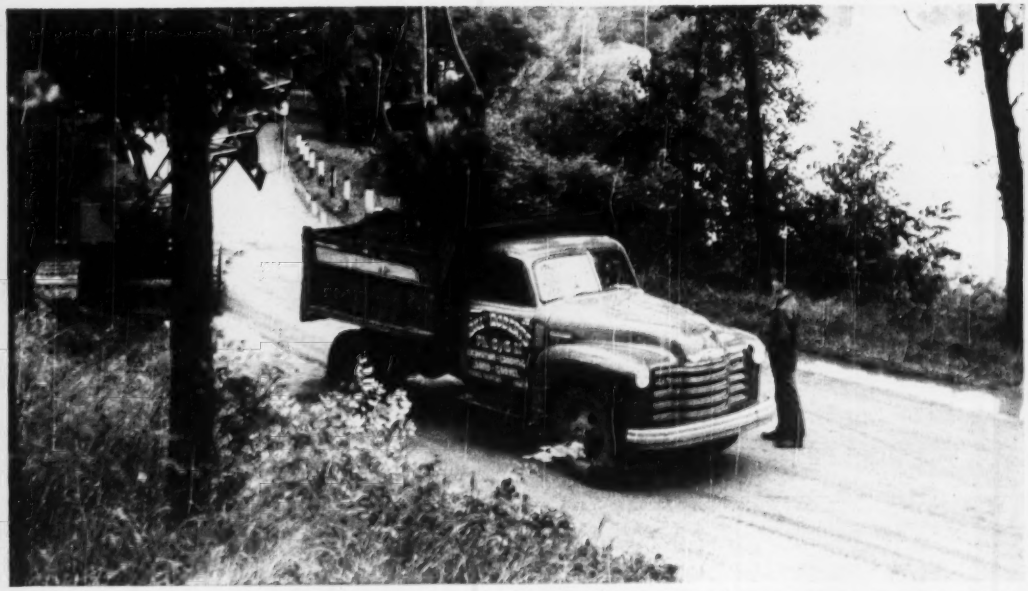
For longer drill life, and more footage drilled at lower cost, use *Texaco Rock Drill Lubricants EP*. These are "extreme pressure" lubricants designed to give full protection against wear and to guard against rust under the severest conditions.

Let a Texaco Lubrication Engineer help you simplify and improve your maintenance lubrication procedures. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT



Top performance for tough jobs!

Chevrolet P•L Truck performance consists of many things. There is Chevrolet design—brilliant and functional—design with a purpose. There is Chevrolet construction—sturdy and dependable—for lasting usefulness.

And there is Chevrolet power—power to deliver the goods—more power than Chevrolet trucks ever had before. Two great valve-in-head engines—the Load-Master 105 h.p. and the Thrift-Master 92 h.p.—make these the most powerful Chevrolet trucks ever built.

These new P•L models are far ahead in features, too; yet they cost surprisingly little to buy, to operate, to maintain. And that adds up to value—the kind of outstanding value that year after year makes Chevrolet America's fastest selling truck.

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICH.

LEADING WITH ALL THESE PLUS FEATURES:

• TWO GREAT VALVE-IN-HEAD ENGINES: the New 105-h.p. Load-Master and the Improved 92-h.p. Thrift-Master—to give you greater power per gallon, lower cost per load • THE NEW POWER-JET CARBURETOR: smoother, quicker acceleration response • DIAPHRAGM SPRING CLUTCH for easy action engagement • SYNCHRO-MESH TRANSMISSIONS for fast, smooth shifting • HYPOID REAR AXLES—5 times more durable than spiral bevel type • DOUBLE-ARTICULATED BRAKES—for complete driver control • WIDE-BASE WHEELS for increased tire mileage • ADVANCE-DESIGN STYLING with the "Cab that Breathes" • BALL-TYPE STEERING for easier handling • UNIT-DESIGN BODIES—precision built.

CHEVROLET P•L

ADVANCE-DESIGN TRUCKS

P*opularity L*eaders

Chevrolet trucks outsell all others. In every postwar year truck users have bought more Chevrolets than any other make—*proof* of the owner satisfaction they have earned throughout the years.

P*erformance L*eaders

The new Chevrolet P•L trucks give you high pulling power over a wide range of usable road speeds—and on the straightaway, high acceleration to cut down total trip time.

P*ayload L*eaders

The rugged construction and all-around economy of Chevrolet P•L trucks cut operating and repair costs—let you deliver the goods with real reductions in cost per ton per mile.

P*rice L*eaders

From low selling price to high resale value, you're money ahead with Chevrolet trucks. Chevrolet's rock-bottom initial cost—outstandingly low cost of operation and upkeep—and high trade-in value, all add up to the lowest price for you.

CHEVROLET

Bridges go up FASTER and at less cost . . .

with AMCRECO *Creosoted* PRODUCTS

Timbers • Piles • Planking

Framed Bridge Timbers

Poles • Cross Arms • Conduit

Adzed and Bored Cross Ties

Bridge Ties

Pressure treated by the Lowry Process for strength that lasts!

When you use Amcreco creosoted materials for bridge construction, you gain the double advantage of speed and economy. Framed bridge timbers go up faster and Amcreco's tried and proven pressure creosoting methods provide low first cost and minimum maintenance expense. On your next bridge job plan to take advantage of this double-barreled benefit. Amcreco engineers will be pleased to assist in every way possible. Write for full information, today.

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COLONIAL CREOSOTING COMPANY

AMCRECO LOWRY PROCESS

GEORGIA CREOSOTING COMPANY

LOUISVILLE KENTUCKY

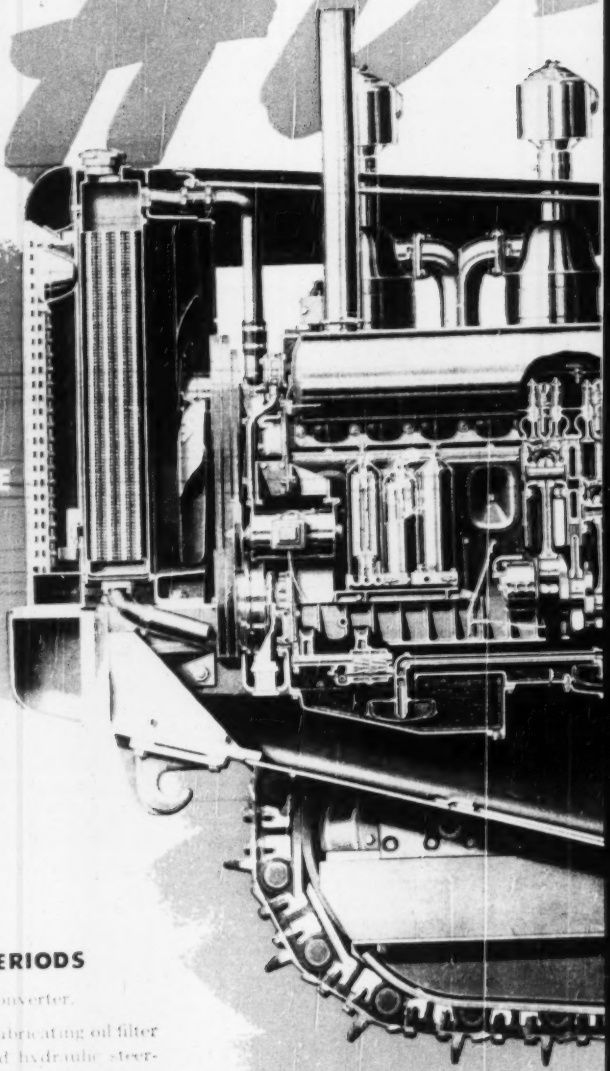
these add up to HD-

- ✓ Torque Converter Drive
- ✓ 40,000 lbs. of Balanced Weight
- ✓ GM 2-Cycle Diesel Engine

plus these bonus features

FASTER, EASIER SERVICING
- **SIMPLIFIED MAINTENANCE**
- **LESS "DOWN TIME"**
- **LESS COST**

HIGHER TRACTOR OUTPUT



All adjustments are unusually accessible.

All fittings or lubrication points readily reached — none under tractor. Draining transmission final drives and engine crank case are the only operations which need to be done from beneath the tractor.

Types of oils and greases needed are cut to a minimum.

SIMPLIFIED LUBRICATION PERIODS

AT 10 HOURS — 2 grease fittings on torque converter.

AT 75 HOURS — drain engine oil . . . change lubricating oil filter elements . . . check final drive, transmission and hydraulic steering . . . only 1 grease fitting on engine clutch release.

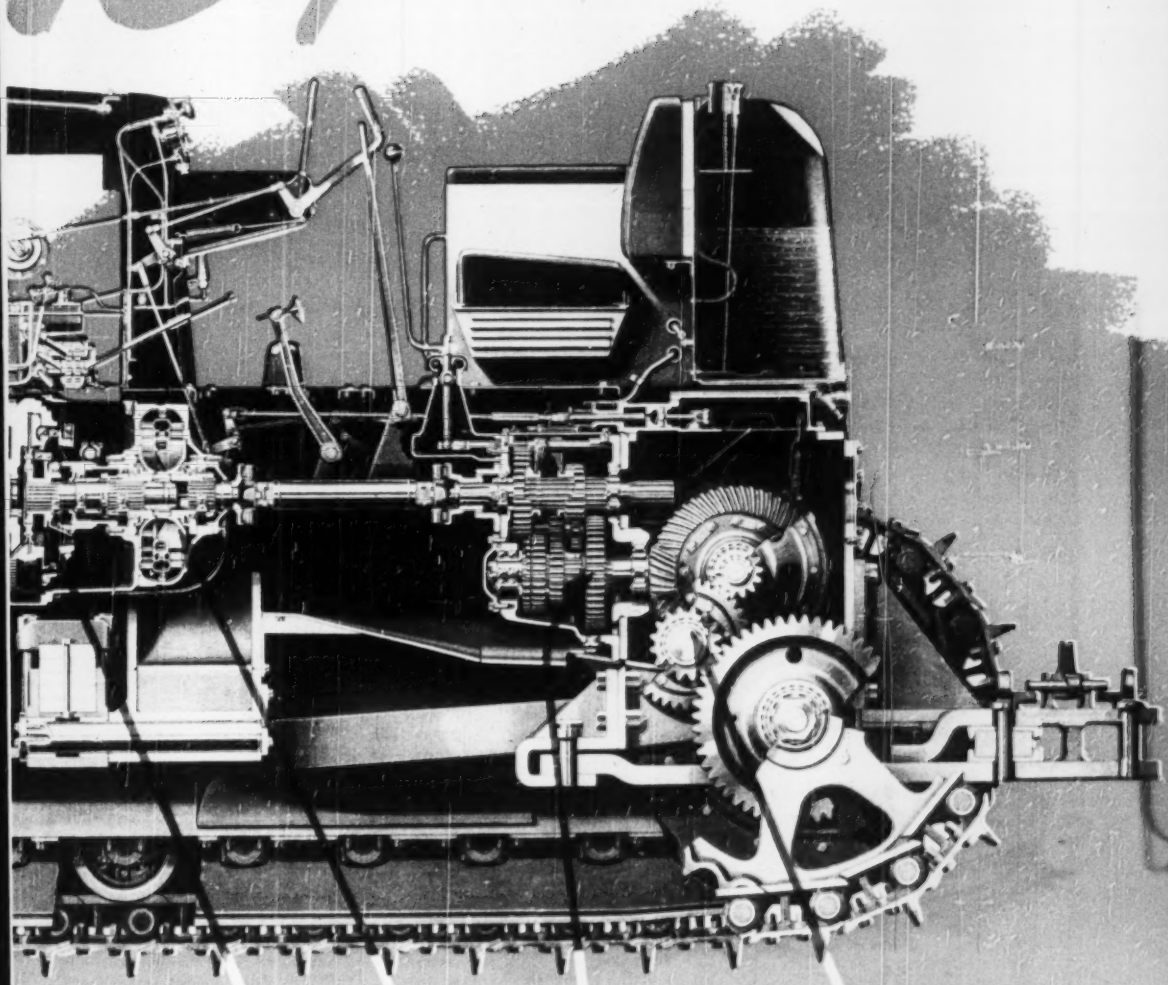
AT 200 HOURS — drop oil in cups of starter and generator. Four fittings: fan, fan belt idler and universal joints.

AT 1,000 HOURS — change oil in transmission and final drive . . . lubricate truck wheels, track idlers and support rollers.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

for Greater Production . . .
for Easier Operation . . .
for Simplified Servicing

'19 performance



maintenance easily accomplished

No need to remove unrelated parts to reach units needing attention.

Engine clutch and torque converter can be removed without disturbing engine or transmission—transmission assembly removable without disturbing engine, clutch or bevel gear.

Each steering clutch removable independently of final drive or bevel gear.

Special tools cut to minimum.

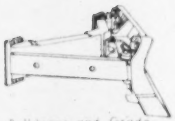
Complete stocks of replacement parts—made in same factory to same exacting specifications as are on original tractor—are carried by Allis-Chalmers dealers.

A TRACTOR MAKES MONEY FOR AN OWNER *ONLY WHEN IT'S WORKING*. THE HD-19 IS LOW IN TOTAL DOWN TIME REQUIRED FOR SERVICING AND MAINTENANCE. IN OUTPUT PER DAY, PER MONTH, PER SEASON, IT'S TOPS.

Straight from the shoulder

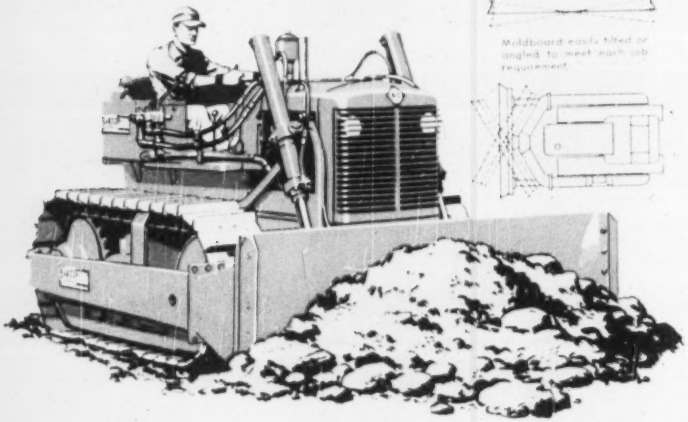
Positive Down-Pressure . . . Direct Lift

These are the twin features provided by the twin engine-mounted hydraulic cylinders in the new Baker Bulldozer and Gradebuilder designed for the HD-5 A-C Tractor. The Baker blade works "straight from the shoulder"—with hydraulic action so *positive* that the blade is forced down until virtually the entire weight of the tractor rests on the cutting edge. The Baker Manufacturing Co., Springfield, Ill.



Bulldozer and Grade-builder interchangeable just bolt the necessary blade to the standard push-beams.

Moldboard easily tilted or angled to meet each job requirement.



P.S.: Baker is the PIONEER and the SPECIALIST in bulldozers

NEWS BRIEFS

Here We Go Again? Los Angeles' Home Building Institute is investigating reports that its members are pirating labor and paying bonuses to get certain materials. One complaint was that carpenters were offered as much as $5 per hour. Another builder said he was idle for a month because his mill had been hired away by a 50-cent wage boost.

Still Another Toll Road Howard, Needles, Tammen & Bergendoff has signed a contract for construction engineering of the 18-mile Denver-Boulder-Crow toll road. The contract provides, among other things, that 50% of the labor be from Colorado.

Farmers Won't Like It Bureau of Public Roads says 400,000 mi of existing rural road ought to be abandoned to save the drain it imposes upon widely needed highway maintenance revenues. It didn't identify which roads it meant, and a spokesman said it wouldn't do so.

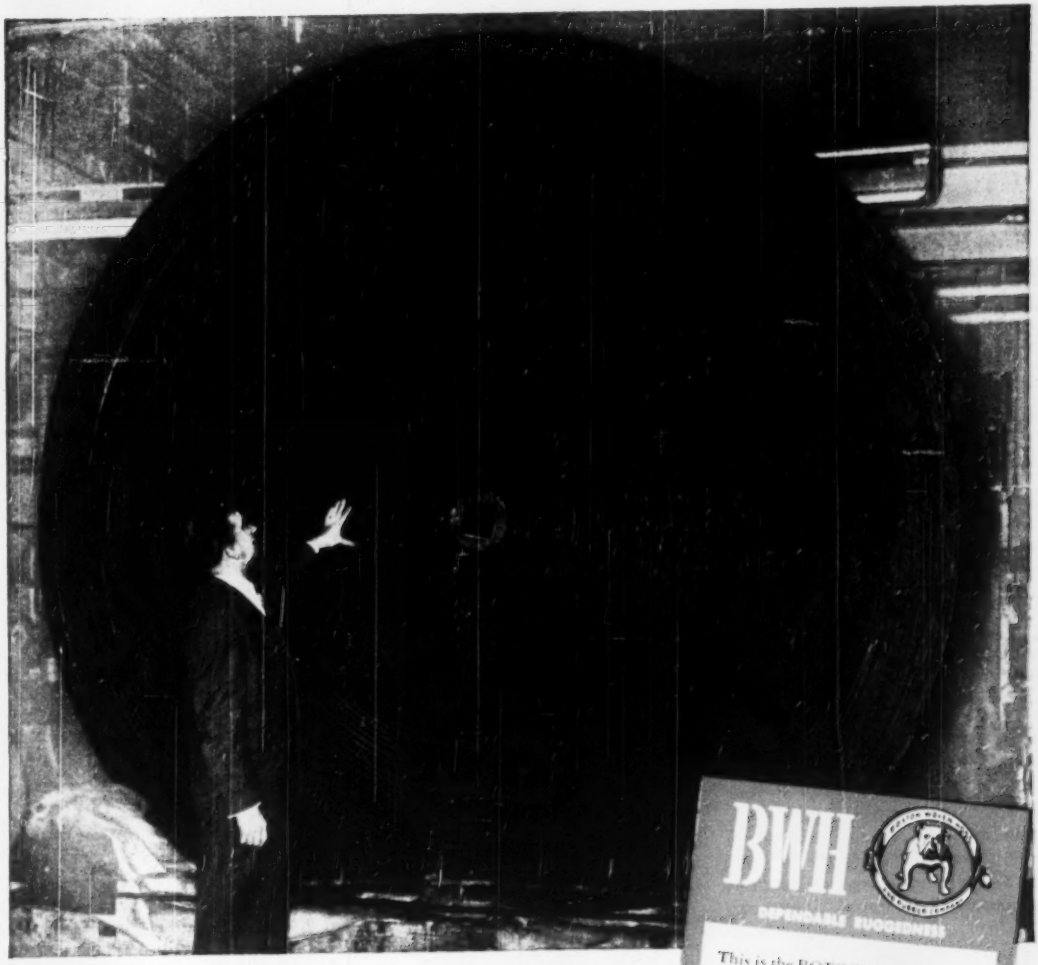
Guess Who Pays It Alabama's attorney general has ruled that contractors must pay the state sales tax on material they use on "municipal improvements." Municipalities don't have to pay the tax if they buy the materials, though.

No Bulldozers Yet Reclamation Bureau engineers are using packhorses to reach the site of the proposed Hell's Canyon Dam on the Snake River between Weiser and Lewiston, Idaho. Terrain around the 600-ft deep hole in the ground is too rough to be reached otherwise. If the 900,000-kw, 4-engine job is ever built, Reclamation will build it.

Two Down, Two to Go Illinois Highway Department and the St. Louis Board of Public Service have OK'd a proposed site for the \$60-million bridge across the Mississippi River connecting South St. Louis with Cahokia at Brooklyn near Chippewa St. Approval still must be had from the Corps of Engineers and the Missouri Highway Department.

Taxes Come Next A Montgomery County, Md., judge says money paid "mechanics" for labor and materials takes precedence over federal taxes in distribution of liens against a defunct construction company. They wouldn't

Continued on page 14



Huge *one piece* BWH Belt

DESIGNED TO CUT WASTE LINES!

When BWH engineers were called on to produce a fast, power-saving, economical belt for a coal mine, this 15-ton Silver King ROTOCORD BELT was the result. It's one of the largest one-piece conveyor belts ever produced. Made by the famous, exclusive BWH ROTOCURE Process of continuous vulcanization, this giant is 1576 feet long, 48 inches wide. It will haul better than 500 tons an hour on a rugged grade at the fast clip of 400 feet per minute. Maintenance worries are lessened by the absence of splices. It's another top performance by BWH . . . leaders for 71 years in the manufacture of mechanical rubber goods of dependable ruggedness for use in all industries.

BWH
This is the ROTOCURE Process of continuous vulcanization exclusive with BWH. It does away with the 30 to 40 foot overlaps occurring in the duck carcass in old-fashioned flat-press curing, eliminates the possibility of operational weakness caused by such overcuring.
Cured Belt
Continuous Uniform Cure
Continuous Uniform Stretch

HAVE YOU A JOB WHERE STAMINA COUNTS? Bring us your toughest problems. We're specialists in solving them. Consult your nearest BWH distributor or write us direct.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS., U.S.A. • P.O. BOX 1071, BOSTON 3, MASS.

STOP RUST *with* RUST-OLEUM

Every day rust eats away at your metal tanks, buildings, fences, stacks . . . everything metal inside and outside your plant. Yet, rust and costly rust depreciation can be *stopped instantly . . . economically* . . . with RUST-OLEUM.

Industry of all kinds . . . railroads, steamship lines, iron and steel companies, refineries, in fume-choked industrial and coastal areas have proved Rust-Oleum for more than 25 years. They know that Rust-Oleum stops and prevents rust!*

Rust-Oleum can be applied without extensive preparation . . . even over surfaces that are already rusted. Rust-Oleum spreads evenly . . . free of brush marks. Its tough, pliable finish protects against every kind of weather, against fumes and heat . . . even against salt air and salt spray.

Beauty and durability are combined in Rust-Oleum for it is available in a large selection of colors . . . including aluminum and white.

Don't wait another day! Let Rust-Oleum give you safe, sure, economical protection against rust. Use it to protect all your metal surfaces. Specify it to your painting contractor or architect. Industrial distributors in all principal cities of the United States and Canada stock Rust-Oleum to supply your every need. See Sweets for complete catalog and nearest source of supply, or write us direct.

*Names on request.

If you have a rust problem, and would like a free survey and recommendations, send your name and address on your business stationery. A qualified factory representative will arrange this free service, which includes a trial size of Rust-Oleum for specific test purposes. There is no obligation on your part. Write today.

RUST-OLEUM CORPORATION

2532 Oakton Street • Evanston, Illinois

(Continued from page 12)

be any surplus for the back withholding taxes if the mechanics hadn't earned it first, the judge said. Maryland state liens ranked third.

Let's Get At It—The Louisiana House enacted a resolution setting a 60-day time limit in which road contractors must get started. It followed the charge that some contractors were bidding with no intention of starting work before next year.

Courts Are For That—Southern Pacific Railroad vs. the city of Burbank, Cal., will be tried in a Burbank court. It aims to determine whether the city can fine the railroad for blocking traffic. An SP engineer got a ticket for keeping a grade crossing closed for 15 minutes, whereas the town ordinance says five minutes is long enough.

Speaking of Beavers—1950 finds the traditional enmity, on the part of beavers, for the plans of men or the works of nature. Conservation engineers in upstate New York found that beavers had done the job for them when they went to an Allegany County forest to build a small pond for fire protection, flood control and fish propagation. And in flooded Winnipeg, Manitoba, beavers were seen and photographed at the height of the flood building a dam along the Assiniboine River, within the city limits.

How Quaint!—Massachusetts Works Commissioner Callahan has announced plans for a bigger and better covered bridge, replica of the type whose passing has been so widely mourned. It's to be built over Mill Brook, in Charlemont.

No Cheerleaders?—New England Power Company has erected a 60-seat grandstand for sidewalk superintendents at the site of its new $2,000,000 steam-electric power plant, under construction on Loff Avenue, in Salem, Mass. Twenty standees can be accommodated too, and the view's fine, since the stand is built on a knoll overlooking the job. Even parking space was provided.

Money-saver Kittens—Reclamation Districts of Illinois, Wash., contemplating put a new type of perforated asphalt irrigation distributor. Rolls of asphalt three ft wide and about 1 in. thick were laid after a dragline excavated about one ft of dirt along a 500-ft test section. The dirt was replaced after the asphalt was laid. The asphalt liner costs about 70¢ per sq yd. Sprayed-on liner costs about $1.50 per sq yd.

Raymond conquers *chubascos*... in
THE WORLD'S MOST UNUSUAL SOIL BORING JOB

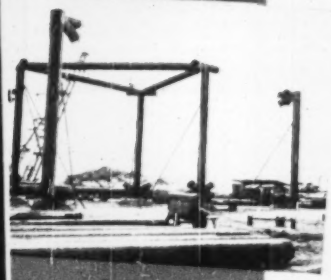
FOR VENEZUELAN OIL CONCESSIONS, LTD.,

1. Construction of pile frame float 30' high, 80' long on each side of the triangle.

The Problem: 250-foot Gow soil borings, accurately spotted five to ten miles offshore in the deep waters of Lake Maracaibo, Venezuela. The Project: pile foundations for future oil well derricks. Special Hazard: 70-mile-an-hour "chubascos," violent squalls that would wreck temporary platforms.

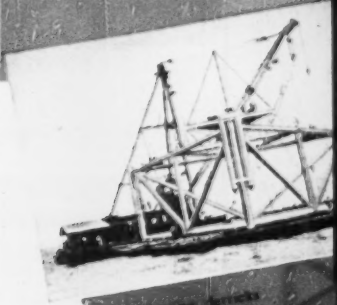
The Solution: Raymond engineers designed a triangular *floating* platform of 22" steel pipe, welded and watertight. The three corner members were left open for 120-foot-long anchor spuds. Assembled on shore from steelwork fabricated in New York, the 60-ton float was skidded onto two barges and towed 32 miles to the first boring location where floating derricks launched it. Spuds and deck equipment were placed later, including winch-controlled anchors at each corner to help in spotting the float and holding it steady during boring operations.

The Moral: When the problem is tough, the answer must still be *right*. That's when it pays to have a resourceful, experienced organization on the job . . . like Raymond!



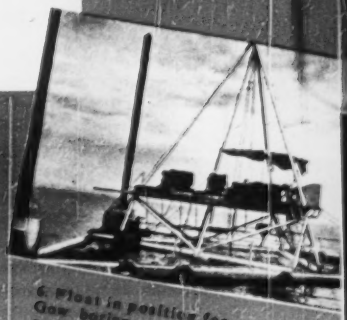
2. Closer view of the starting framework, showing 22" diameter steel pipe being used.

3. Completed framework, welded and watertight except for the corner verticals which will accommodate anchor spuds.



4. Floating derricks preparing to lift the first from barges and place it in the water.

5. Launching the platform float. Note work platform erected 10 feet above framework.



6. Float in position for Gow boring operations, anchored by the 120' spuds and cables at each corner.

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THE CONSTRUCTION WEEK

WHEN DO WE QUIT?—The key to adjournment of Congress, Washington thinks, is Truman's spending program. Appropriations are behind schedule, delaying new contracts. But, once Congress ok's the $40 billion or so for fiscal '51, (which starts July 1) the rush to adjourn will be on. Here's how the money timetable stacks up: The House-approved Omnibus Bill—(Carrying $30 billion) is the key measure, and it won't get by until possibly mid-August. Other bills of interest to construction—the new highway aid bill, rent control, social security expansion, for example—will eventually get through, although not without trouble.

VIBRATIONS—A 56-mph wind early in June caused the largest amplitude vibration of the Golden Gate Bridge deck since motion-recording instruments were installed four years ago (ENR Aug.8,1946,p106). However, the vertical movement of 42 in. was hardly noticeable to motorists because of the long span (4,200 ft.) and the slow nature of the movement. No damage resulted—engineers computed a negligible additional stress of only 700 psi in the stiffening trusses.

PHANTOM CONSTRUCTION—World War II emphasized and broadened the benefits that power system men have been able to achieve by interconnection of electrical systems and integration of their loads and capacities. One of the best examples was disclosed by a Pacific Northwest utility man, who said last week that interconnection of all power systems in his region (comprising all or parts of five states) made possible capacity savings equivalent to power plants that would cost $300,000,000.

NEW OPPONENT—Meyer Ellenstein, who as former mayor and now revenue and finance director of Newark, N. J., has long been a gadfly to the Port of New York Authority, found a new opponent last week. He started after the New Jersey Turnpike Authority, which plans to build an earthfill embankment to elevate the new turnpike through part of Newark. Ellenstein demanded use of structural steel for the elevation, on the ground that a solid fill would "destroy" property valued at more than $3,000,000. Said Paul L. Troast, authority chairman: Use of steel would cost an additional $10,000,000—and the authority does not have that much extra money.

SPEED IS NEED—There's a lot of time-and-a-half and double-time going into New York's new emergency pumping plant on the Hudson River below Poughkeepsie. The job has to be done by Nov. 15—unless the contractor wants to pay $5,000 a day for tardiness. And he stands to collect $5,000 a day for each day he finishes ahead of schedule. Progress to date indicates that the contractor expects to be on the collecting end when the deadline is reached.

WHOSE MARBLES ARE THESE?—Interior Department's Southeastern Power Administration has implied a change in the principle that U. S. rivers "belong to all the people." It came last week in a rehearing before the Federal Power Commission. At stake: Virginia Electric & Power Co.'s application for a license to develop the Roanoke Rapids power site on the Roanoke River. Ben Creim, SEPA administrator opposing Vepco's bid, was asked whether he'd operate Buggs Island power plant (an upstream Army dam whose energy SEPA will market) "so as to help the (Roanoke Rapids) licensee obtain sufficient capacity to make the project feasible." Replied Creim: "I would not. There will be no operation at Buggs Island which would require water release or power production for any agency without existence of a contract covering terms and conditions under which service will be performed." Interior's threatened refusal to play, though, must be tempered to fit the facts of water law and the fact that FPC, not SEPA, conditions licenses for projects on U. S. navigable streams. Also, the Army will operate Buggs Island, even though SEPA sells its power. Interior having indicated it will go to the Court of Appeals if FPC rules against it, the prospects look good for a legal decision on Interior's concept of water law.

WARNING—A rather solemn warning note moved into the annual convention of the Association of Building Owners and Managers last week—a flag on the possibility of overbuilding office space. Lee T. Smith, president of the Real Estate Board of New York told owners that production of postwar office space is already near peak levels in some centers (New York City particularly) and needs to be checked to prevent repetition of excessive vacancies and low rentals of the 1930's. This year alone, said Smith, more than 4,208,000 square feet of office space are being added in Manhattan alone, under the lure of unprecedentedly high rentals. "Any sudden drop in employment or income could create a critical credit situation," he warned. Among other things that give his opinions weight is this: In 1926, as president of the National Building Managers group, Smith issued a similar warning.

High-Efficiency 'Incor' Performance

Speeds Erection of Ravenswood Houses—West Section

NEW YORK CITY HOUSING AUTHORITY
RAVENSWOOD HOUSES (West Section) Long Island City

Architect: THE FIRM OF FREDERICK G. FROST JR., New York

Ready-Mix 'Incor' Concrete:
COLONIAL SAND & STONE CO., INC., New York

Contractor, Concrete Frame:
CAYE CONSTRUCTION CO., INC., Brooklyn, N. Y.

● One of New York City Housing Authority's largest projects is 2166-apartment Ravenswood Houses, Long Island City. Housing Authority projects are quality-constructed in every last detail—and they move ahead at driving speed. Because at today's costs, time saved is money saved—and how!

All last winter, frame concreting on the fourteen 6-story units in Ravenswood's west section clicked ahead on precise schedule—for CAYE CONSTRUCTION CO., INC. switched to 'Incor' 24-Hour Cement. In cold weather, column forms were stripped in 24 hours, slabs in 48 hours. That kept the job right on schedule—and saved a complete set of forms. *Big money, that, at today's form costs!*

Came Spring—and things were running so smoothly that they kept on using 'Incor'. For high-efficiency 'Incor' performance knows no season. Straight around the calendar, 'Incor'* promotes the smooth-running, time-saving efficiency on which today's close-margin profits depend. Send for illustrated booklet, 'Cutting Concrete Costs'—write Lone Star Cement Corporation, 100 Park Ave., New York 17.

*Reg. U. S. Pat. Off.

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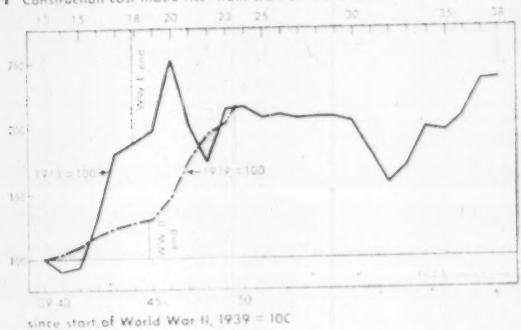
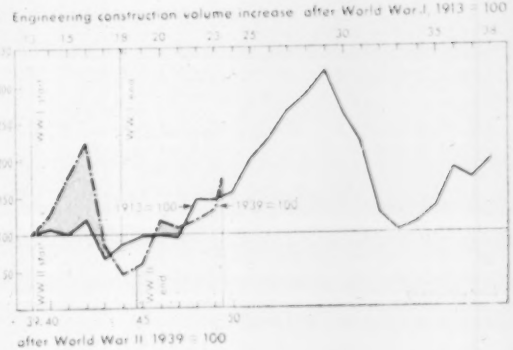
CONSTRUCTION TRENDS

1 Construction cost index rise from start of World War I, 1913 = 100



since start of World War II, 1939 = 100

2 Engineering construction volume increase after World War I, 1913 = 100



after World War II 1939 = 100

RISING PRICES AND THE BOOM

Current price jitters are due mainly to the fact that the prices that fell fastest last year are rising fastest this year. These are lumber, steel scrap and the nonferrous metals. Calm prevails in most other construction materials.

Lumber returned this spring to the wild market conditions of 1947's era, as the unprecedented housing boom caught it with its production down. But production for the past three weeks has topped new orders and appears close to catching up with shipments. And lumber prices still average below their 1948 highs. So it looks as though these wild price rises could be halted close to the 1948 peak.

The nonferrous metals, too, have shot up—but not all the way to the altitudes from which they fell last spring. Copper is close, zinc two-thirds of the way and lead only half of the way back up.

Steel scrap prices, however, have set a new, all-time record high, more than double the World War II high. This has already increased the cost of producing steel by $2 to $3 a ton. As this is written, mill prices of steel to the customers are expected to hold, barring still further pyrotechnics from scrap prices. That steel price stability is very delicately balanced, however, is indicated by the fact that a couple of smaller mills have already raised prices on plates.

Wage rates have come through this year's main bargaining season with a moderate 5 to 6½-cent increase, including a small crop of welfare and vacation benefits in lieu of cash.

Thus, lifting overall, basic construction costs up around 7% above their dip of last year. It is a good time to take stock.

Wars are always blamed for postwar price gymnastics. So let's compare how construction costs have performed since the start of the last war with the corresponding recovery period after World War I.

For this purpose, the accompanying chart, 1, starts with the ENR construction cost index at 100 at the beginning of each war. The 1913-38 cost curve is thus based on 1913 = 100 and the 1939-50 cost curve is based on 1939 = 100. Each, therefore, shows directly the percentage gain in construction costs.

There was a wild rise and fall of construction costs after the first war, and an orderly rise after the second. But note that after 5 years the cost rises measured by the two curves are relatively the same, in spite of the different routes they took.

The chief concern over rising costs is the fear that they will drive new construction out of the market. The opposite, however, is true in the early stages of the rise. Then owners rush to get work under way before prices go any higher. This fact has undoubtedly contributed to the unexpected magnitude of this year's boom, both in housing and in heavy construction.

Cost increases this spring have been largely in what contractors and builders have to buy. So far, these construction companies, for the most part, have absorbed the increases in their basic costs and have held their own bid prices on an even keel. But some housing builders have had to raise their selling prices 5 to 5%, mainly because of the sharp lumber price rise. Labor and brick have added a little pressure, too.

This raises the fear that higher selling prices for construction will choke off the present boom. It is also feared that the boom itself will force prices up higher, a vicious circle.

This was not the experience, however, in the boom in the late '20's. There the peak of the boom was accompanied by a 5-year period of cost stability.

In volume, too, five years after the end of World War II, the increase is relatively the same as in the corresponding year after the first war (Chart 2).

Thus, at this date, construction costs and volume rises are striking similar to the situation 27 years ago, just before that 5-year record of cost stability. Can this generation repeat this price stability pattern?

"OWNERSHIP . . . does not exceed 1 cent per ton of materials handled"

Expense

NEFF CONCRETE PRODUCTS Co., Inc. Danville, Illinois . . . *writes as follows*—

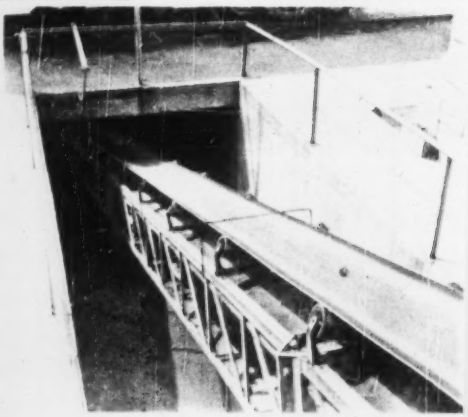
"It seems to be only human nature to express our dissatisfaction when we purchase something which does not give us the performance that we expect, but usually we neglect to express our satisfaction or praise when we purchase something that performs even better than expectations.

"We purchased from you early in 1946 a 24-inch belt conveyor 153 feet long to transport material from our dumping hopper into our elevated bins. Since that time this conveyor has handled in excess of 150,000 tons of sand and gravel without any repair or maintenance of any kind except grease. We estimate that ownership expense to us (including replacement of belt and normal depreciation) does not exceed 1c per ton of material handled.

"Needless to say, we are very well pleased with this piece of equipment and have recommended it to others having problems similar to ours."

DETAILS OF INSTALLATION

This ATLAS Model 24 Stationary Belt Conveyor is 153 feet long c-c and is equipped with 5" dia. Timken bearing idlers, 25 hp. electric motor drive, gravity take up, double catwalk steel supports and steel "A" Frames set on concrete piers. The conveyor is inclined at 18°, has a belt speed of 300 feet per minute, and handles about 180 cu. yds. per hour. Aggregates are dumped from hopper-bottom railroad cars into the under-track hopper which feeds the materials onto the conveyor. A turnhead at the head end directs the discharge to the selected storage bin compartment. The conveyor was installed to fit in with the existing building layout and is a permanent addition to the equipment of this industrial plant.



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Telescopic and Portable Hi-lift Loaders and Stackers
Special Installations of Industrial Conveying Equipment
Precision Idlers and Conveyor Accessories

Super Colossal

THE PLAN THAT the Bureau of Reclamation is studying to transfer water from the Pacific Northwest—where there is an excess—to Southern California—where there is scarcity—will be greeted with a variety of comment. Whether such a project would be a colossal boondoggle or a stupendous example of engineering statesmanship will be debated for a long time. In fact, a good deal more information will have to be available before much debate will be worthwhile. To that end, the bureau has a staff of 20 men engaged in collecting the facts that are needed before sound conclusions can be drawn (ENR June 15, p23).

In one respect the proposal is in keeping with the times. Nothing is too big or costly to dream about, even to study seriously. This water transfer proposal, for example, involves 1,000 miles in distance and a volume of water upwards of 20 million acre-ft annually. The distance is over three times that over which water is now being moved to Los Angeles and the quantity is about 20 times the capacity of the Colorado River Aqueduct. Granted that precedent exists for overcoming any of the physical obstacles that might be encountered, there is still the cost to be considered. That might well be the $5 billion question.

Transporting water the length of our Pacific Coast offers an intriguing project but one which might require a joint venture of King Midas and Paul Bunyan to carry out.

Water Supplies and Highways

TWO QUITE DIFFERENT public facilities—municipal water supply and highways—raise a common question: How can enough be provided to meet the need?

It is no great task for engineers to estimate well in advance the volume of water supply or the amount of highway construction needed for long-range programs. But that is not enough. Failure to get public support, official approval or adequate financing for any needed improvement, be it a water supply or a highway, inevitably seals its doom and keeps it in the "proposed" stage when it should be advanced to construction.

A prime example of this, and one from which highway engineers can take a warning is New York City's water shortage. It was the same old story—long-range plans by the city's Board of Water Supply made as far back as the late 20's, failed to materialize from one cause or another. Yet when the water shortage became alarmingly acute last year, who received the major blame? Not the municipal or other public agencies which helped to bottleneck the development of an adequate water supply, but the water works engineers themselves.

Are we going to let a similar situation develop in the highway field? We talk of how highway obsolescence is rapidly getting ahead of new construction, and realize that it may eventually lead to a major crisis in our transportation system. Highway engineers not only must develop long-range, practical plans for building an adequate system of highways, but they must carry their message repeatedly and strongly to the public to secure and maintain its support for their programs; they must drive relentlessly for sufficient funds to finance the work, and they must gear their construction programs to meet increasing traffic demands. Failing to do so, they will meet increasing public criticism as our transportation system continues to break down and become obsolete. It and when this happens, it will not be enough for the highway engineer to say, "I told you so 5, 10 or 20 years ago." Now is the time for concerted action, not after the damage is done.

Buyer of Prestressing Beware

ABOUT TWENTY YEARS AGO, Freyssinet demonstrated that high steel stresses are necessary for prestressing concrete. Otherwise, the benefits are lost because of shrinkage and plastic flow of the concrete.

Prestressing has proved practical with steel tensioned initially to over 100,000 psi. Yet, despite this experience, some manufacturers of precast concrete structural members are prestressing to only about 20,000 psi. In a relatively short time, most of this initial stress will be lost.

Shortly after the steel has been tensioned to 20,000 psi, load tests may indicate that the beam has ample strength and high stiffness. But if a similar beam is tested several months to a year after prestressing, tension cracks may appear under relatively low loads, deflections may be much larger and failure may occur considerably earlier.

Loss of prestress does not increase very rapidly with increase in tension in the steel. While it may be 80% of the tension for low values, it drops to about 15% for initial stresses well over 100,000 psi, in which case it can easily and economically be taken into account in design.

With tensions in the 20,000-psi range, the best that can be expected is that if the steel is bonded adequately to the concrete, the members are, for all practical purposes, of ordinary reinforced concrete construction. Consequently, any claims that such members are prestressed may be either exaggerations or misrepresentations.

Before precast, prestressed concrete structural members are purchased, buyers should check to determine that the long-time prestress in the concrete will be adequate to counteract design tensile stresses.

HOW WHITE CONCRETE REFLECTING CURB

made with ATLAS *White* DURAPLASTIC*

MAKES DRIVING SAFER

Photos of Atlas White Concrete Reflecting Curb installed on new section of Taconic State Parkway, east of Poughkeepsie, N. Y.
Contractor: John Arborio, Inc., Poughkeepsie. Curb installed by Provenzano & Morelli, Hewlett, N. Y.

Greater driving safety . . . greater durability — that's why N. Y. State Highway Department specified White Concrete Reflecting Curb, made with Atlas Duraplastic air-entraining portland cement, for this new section of New York's busy Taconic State Parkway.

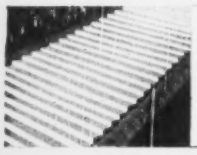
As shown in these photographs, the corrugated surface of the curb forms a ribbon of white, contrasting with pavement gray, outlining the roadway clearly by daylight.

On dry nights, the saw-tooth faces of the curb catch headlight rays and reflect them back to the driver, give him the good visibility needed for night driving. And on rainy nights, when clear visibility is most needed, the wet faces of this curb become even more mirror-like, safely guide drivers along the parkway.

In addition to greater safety, Atlas *White* Duraplastic provides greater all-round durability to Reflecting Curbs at no extra cost. For this air-entraining cement makes white concrete with these advantages: increased plasticity, easy placement, minimized segregation and bleeding, higher resistance to effects of freezing-thawing weather and scaling action of de-icing salts. And Atlas *White* Duraplastic costs no more than regular White cement.

Send for free information to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Bldg., New York 17, N. Y.

* Duraplastic is the registered trade mark of Portland cement manufactured by Universal Atlas Cement Company



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ENGINEERING NEWS-RECORD

JUNE 22, 1950 VOL. 144 NO. 25

Road contract prices firm; competition, volume high

ENR survey in 32 states shows low bids almost everywhere are below estimates—Unit prices down widely, also—Only one state reports decreased competition

ENR Staff Report

There's been no significant increase in the cost to the public of state highways.

This is true despite increased labor costs this spring and some threatened material shortages due to a sharp increase in the value of contracts let.

That's the principal finding of ENGINEERING NEWS-RECORD correspondents in 32 states. These findings are based on road lettings during the past month. On the basis of such up-to-date information, one other conclusion seems justified:

Chances are good that current highway contract price levels will hold this year. This could be upset, if steel touched off a general price increase. The reasons: Most of the labor cost increases are now in. If road contract prices have survived the boosts already recorded, they ought to be able to hold until a new wave comes along.

Lumber, nonferrous metals and labor have been the principal basic construction costs to rise this year. Of these, only labor is significant in highway costs.

Specifically, ENR's correspondents reported:

1. In 21 states, unit prices are below last year's levels. Six reported them about the same; only two found them higher.

2. Engineers' estimates of job costs are lower in 15 states, or about the same in 12 states, as last year's. Only in one state were they reported above last year's.

3. Almost universally, competition for state highway work is stiffer. Highway departments of 24 states reported more competition. In three, it is about the same. Only one reported less.

4. And almost everywhere, low bids are coming in below engineers' estimates. That was found true in 24 states. Four found low bids somewhat above estimates, two found them about the same. One state in which low bids are above estimates says that's been true only for a few weeks, that previously, they'd been below estimates. And another state says half its bids are above estimates, half at them or below.

• **It's good news**—These findings make good "anti-inflation" reading for state highway departments, many of whom find their budgets miserably short of the demands which are being piled on them. And the results are puttering fairly encouraging in the light of the work facing road contractors. For the first five months of 1950, street and road contracts reported to ENR were 55% ahead of those reported during the comparable period last year.

Informed opinion as to why contract prices remained so stable in spite of the demand and the applicable cost increases runs in this vein:

There's so much work that overhead charges for any given job can be smaller than they could be at a lower volume.

Contractors have a lot of new equipment on their hands, thus can work more effectively, bid lower.

Open weather last winter allowed many jobs to be cleaned up rather than held over for completion this season. Thus, contractors could get to work faster and with less confusion this spring.

There's a widespread and apparently genuine desire among contractors to hold the price line so as not to drive work out of the market.

And of course, the competition unprecedented in some cases has an inevitable salutary effect on bids.

• **"More for our money"**—Perhaps typical of the sentiments ENR correspondents found were those expressed by O. L. Kipp, assistant commissioner and chief engineer of the Minnesota Highway Department. Said he in part:

"Conditions are very favorable from the department's standpoint and we are getting more for our money than

(Continued on page 24)

THREE-TONE HOMES—This 17-story apartment building will be erected in Chicago for 200 families. The contrasting effect is obtained through use of black structural tile on walls facing street, red brick between white vertical columns on side walls. Windows in six sections will be set out three ft from structure. First floor won't be walled in, will have glass walls set back to form arcade. L. R. Solomon & Associates and Josef Gutmayer are architects.

Jobs are found safer but not safe enough

Steady advances in reduction of industrial accidents—but nothing to shout about—was the tenor of the reports submitted recently to the second meeting at Washington of the President's Conference on Industrial Safety.

At the opening session, President Truman reaffirmed his declaration of a year ago that the conference goal is to cut job-accident rate in half by the end of 1952, through local efforts.

On both points, there was progress to report. Work injuries in the U. S. declined more than 7 percent from 1948 to 1949; eleven states had held statewide safety conferences—sometimes involving as many as 2,000 participants for several days.

Labor representatives took an active part in the Washington meeting and delegates from state government and industry insisted they must.

"Unless business, labor and the states get together to make accident prevention a facts the labor unions may demand that safety requirements be written into labor contracts," said one industry spokesman. "That would subject safety measures to legal interpretation, mediation and arbitration—and it could produce complications that would hamper safety work."

The industrial conference of the National Safety Council agreed to take on execution of four major points proposed by the President's Conference engineering committee. Safety in design of machinery, equipment, plant and processes, detailed studies of relationship between safety and efficiency, preventive maintenance, education of management.

CABLE STRINGING—A 69,000-volt power cable through the 13½-mi Alva B. Adams irrigation tunnel through Colorado's Great Divide is encased in nitrogen-filled (200 psi) steel pipe. Pipe was welded into half-mile sections outside the tunnel, brought to position on dollies guided by wooden "railroad." Gas-filled cable is inside pipe as it's transported. (General Electric Photo)

Court OK's amendment to water supply plan

A new plan to augment the water supply for Youngstown and Niles, O., has won court approval.

The proposal was made by the Mahoning Valley Sanitary District as an amendment to an earlier plan. The new proposal will permit MVSD to obtain more water from Berlin Reservoir. It would cost about $5,000,000.

Under the amended plan, the district would contract with the Corps of Engineers to take up to 54 mgd from Berlin which, and if needed, in the Meander Reservoir, water source for the two cities. Meander's present safe daily yield under adverse conditions is 50 mgd.

MVSD's chief engineer, L. E. Bassett, said plans for construction of a nine-mi pipeline and pumping station will be drawn so as to render them usable whenever land acquisition at Meander is complete. The court order provides for completion of the project in two stages—with the pipeline and pumping station first.

A contract already has been agreed upon between the government and MVSD. It will extend 50 years from next Jan. 1, and would charge $2.50 per million gallons reserved and $2.50 more per million gallons actually pumped.

The project will be financed by bond issue, which would be serviced by additional taxes. Almost $1,500,000 is already available.

Road contract prices holding firm

(Continued from page 23)

at any time since World War II."

Arizona, too, is saving money. With competition the keenest that has been seen there since the mid-'30's, state officials figure they've saved $500,000 this year on low bids under department estimates.

In Pennsylvania, highway building is at a peak level. Up to June 10, the department had received 960 bids on 134 contracts involving $60,000,000. The department figures that the present rate is about as fast as contractors can go.

• **North Carolina differs**—North Carolina was the only state to buck the trend. In three of four categories, it was at odds with other states, in a fourth, not completely in line. It reported unit prices up in the last two lettings (May 30 and June 6). And during the last two months, it has had fewer requests for bidding proposals than it was getting before that. Low bids at the two most recent lettings were running above engineers' estimates. About the only place where its recent experience jibed with that in a significant number of other states was in the estimates themselves. They're at about the same level as they were last year. Officials reported that price increases there are more marked for structures than for roadways.

A possible explanation for North Carolina's divergence from the trend lies in the fact that this state has a $200 million rural road program fully under way. Chairman Henry Jordan, of the Highway Commission, has been predicting for a year for another reason entirely—that the state's road builders might not be able to handle all the work the commission figured on proposing to them.

• **The results**—By regions the answers were as follows:

New England, (three states reporting)—Unit prices—lower, 2; same, 1. Engineers' estimates—higher, 1. Competition—greater, 1; less, 1. Low bids to estimates—below, 2; above, 1.

Middle Atlantic, (four states)—Unit prices—lower, 2; same, 1. Estimates—same, 4. Competition—greater, 4. Low bids to estimates—below, 4.

South, (six states)—Unit prices—lower, 2; same, 2; above, 1. Estimates—lower, 3; same, 2. Competition—greater, 4; less, 1. Low bids to estimates—lower, 3; same, 1; higher, 1.

Mid West, (five states)—Unit prices—lower, 4; same, 1. Estimates—lower, 3; same, 2. Competition—greater, 5. Low bid to estimate—lower, 4.

West of Mississippi, (11 states)—Unit prices—lower, 8; same, 1; higher, 1; (Texas). Estimates—lower, 6; same, 4. Competition—greater, 7; same, 2. Low bids to estimates—lower, 10; higher, 1. (Texas).

Far West, (three states)—Unit prices—lower, 3. Estimates—lower, 3. Competition—greater, 3. Low bids to estimates—lower, 1; same, 1; higher, 1.

Total 32 states—Unit prices—lower, 21; same, 6; higher, 2. (29 answers). Estimates—lower, 15; same, 12; higher, 1. (28 answers). Competition—greater, 24; same, 3; lower, 1. (28 answers). Low bids to estimates—lower, 24; same, 2; higher, 4. (30 answers).

NSPE meet emphasizes professional duties

Freedom to practice and engineers' role in public affairs stressed at annual convention in Boston

Freedom to practice engineering for the best good of all nations struggling to revive themselves was the keynote of the annual meeting of the National Society of Professional Engineers at Boston.

The program, by no means limited to immediate concerns of the engineering profession, also emphasized:

1. The importance of engineering leadership and ability to expanding national defense programs.

2. The importance of participation by engineers as citizens and specialists in government activities to achieve sound economic objectives.

3. Cooperation between branches of engineering to achieve high professional ideals.

• **Hit collective bargaining.** The society flatly condemned as unprofessional collective bargaining by organizations of professional engineers. This came in a resolution holding:

"It is definitely unprofessional for a professional engineer, professionally employed, voluntarily to join a heterogeneous labor union dominated by or obligated to non-professional groups. The individual responsibility and independent judgment required of a professional engineer are incompatible with the regimentation fundamentally inherent in unionization."

Recognizing that such membership may be involuntarily or dependent upon sub-professional work, the group urged that it be regarded as an excess temporarily to be discarded upon achievement of professional status. In declaration of these concepts among student engineers as in student directorates was recommended.

• **Back Hoover proposal.** The society faced squarely a deep-seated political dispute by recommending establishment of a board of engineering review as a top policy group to assist in settlement of inside-bureau disputes between the Army Engineers and the Reclamation Bureau. Such a group was recommended by the Hoover Commission last year. And such a proposal has been involved in the continuing struggle over proposals to merge civil functions of the Corps of Engineers with those of the Reclamation Bureau.

The convention emphasized the need for a survey of the present status of its priority applying to registration of engineers in training. NSPE's registration committee will continue to study the problem and will make recommendations thereon to the various registration boards and state sections of the society.

Sidney L. Stolte, St. Paul architect and engineer, was elected president, to replace Alan G. Stanford. These vice-presidents also were elected: George Krueger, New Jersey Department of Labor; John D. Coleman, Dayton, O.; C. L. Emerson, vice-president of the Georgia Institute of Technology; Lawrence L. Dresser, Tulsa; and Earl L. Holm, Sacramento.

R. B. Allen, of the University of Maryland, was elected treasurer, and P. H. Robbins, Washington, D. C., executive director.

Army would deepen 92 mi of Missouri River

Army Engineers of the Missouri River Division have issued a report recommending that the river's 9-ft channel be extended 92 miles from Sioux City, Iowa, to Yankton, S. D. The report also claims that further extension to Williston, N. D., is entirely feasible.

Brig. Gen. J. D. Sturgis, Jr., division engineer, submitted the report to the Chief of Engineers. It is now in the hands of the Board of Engineers for Rivers and Harbors. Cost of the proposed work is about $37,000,000.

Below Sioux City on the 760 river miles to the Missouri mouth, authorized channel improvement is well along toward completion.

Flood control studied in Red River Valley

Canada is considering flood control measures for the Red River Valley, now recovering from a disastrous flood which continued for more than a month. [ENR May 18, p. 23].

The Canadian study complements an international survey which has been before the International Joint Commission for more than two years. Both U. S. and Canadian governments have asked the commission to speed its study.

Meanwhile, rehabilitation is in full swing both in the Winnipeg area and the river valley south to the international border. More than 100 persons are employed on the work this week. Last year payments for being made from a fund of more than $4,500,000.

The Royal Canadian Air Force has prepared what it believes is the largest photographic mosaic ever produced in Canada. It is composed of 150 enlargements of 9-in. negatives exposed at the height of the flood. Overall dimensions of the mosaic are 55x10.5 ft. It was taken for the International Joint Commission and the Manitoba government.

Basing Point bill veto leaves pricing puzzle

Supreme Court next fall may clarify one main point, but concerted action on prices in an industry is out

"Where do we stand now on freight absorption and delivered pricing?"

That's the question executives in cement, steel and other heavy industries are asking their attorneys this week as a result of President Truman's veto of the Basing Point bill.

The answer seems to be:

"Legally, you're facing the same situation you faced two years ago when the Supreme Court came down with the Cement Institute decision outlawing the basing point pricing system."

But there has been some clarification—if it can be called that—arising out of the debates in Congress and the President's veto message. On at least two points almost everyone in government is agreed—including the Federal Trade Commission, which started the whole mess. These are:

1. Individual use of freight absorption is legal.

2. Individual use of delivered pricing is legal.

• **No concerted action.** But using any kind of pricing system that could be labeled a planned common course of action by members of an industry is still likely to run into trouble at FTC. The agency is hammering at this point harder than ever. Shortly before the veto was announced, FTC issued a formal release chiding newswriters for "failing to make clear" that a proposed order against 16 corn products concerns "solely practices of the type of basing point and zone systems of pricing only when such systems involve concerted action, conspiracy or industrial agreement."

Actually the provision of the vetoed act designed to legalize "meeting a competitor's price in good faith" under any circumstances, has never been tripped.

Although, as it now stands, a businessman who fights a lower price to meet competition may be prosecuted by FTC for discrimination against other customers. Under the bill, the seller would have been completely in the clear if he could show that he was compelled to meet his competition.

There is exactly the issue before the Supreme Court in the Standard Oil of Indiana case. But the court decided not to decide that case while the bill was in doubt and the case went over until next fall.

The veto is a victory for FTC and for small business groups that are fighting changes in the Robinson-Patman anti-price discrimination act.

STRENGTH FOR THE UN—This 54-ton girder, 88½ in. deep, is being erected in the Meeting Halls building of the United Nations group, in New York City, by American Bridge Co. It will span an 84-ft conference room from which two columns were omitted. Fuller Turner Walsh Slattery is general contractor. (ENR Staff Photo)

Court affirms sale of condemned land

Considerable litigation seems to be ahead, but a Texas court has ruled that the city of Dallas and the Dallas Housing Authority may condemn private property for slum clearance purposes and resell it to private developers.

David McCord, Jr., a property owner who contested the case before a Texas court of original jurisdiction, promised an appeal and said he would carry it to the state supreme court of necessity. Federal officials, meanwhile, said no more U. S. funds would be forthcoming until the state's highest court has settled the issue. A \$4,000,000 loan had been made to Dallas to help finance a \$25,000,000 slum clearance program.

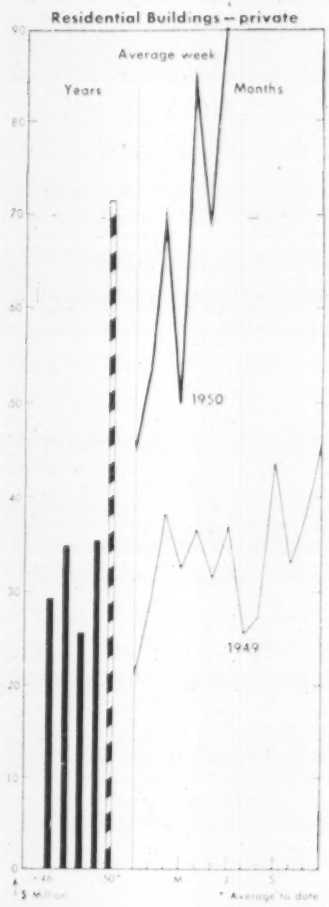
The judge held that the city might condemn property for slum clearance purposes and resell such property to private developers as a natural result of its slum clearing. Authority was also held to have the right to bargain with purchasers before condemnation proceedings are instituted. The court further held that the housing authority has the right to bargain with purchasers before condemnation proceedings are instituted. The court

CONSTRUCTION BUSINESS

Housing hit new record in May, seems headed higher in June

Homebuilders scored another record last month when they started 140,000 nonfarm housing units. They may start even more this month.

Contract awards so far in June appear to be headed higher than earlier record-breaking months, as reported by ENGINEERING NEWS-RECORD.



The 140,000 starts reported by Bureau of Labor Statistics for May exceed the April record by 14,000 homes. They bring the five-month total to 537,000, 52% more than last year's 355,100 housing starts.

If the January-May rate keeps up all year, about 1,300,000 nonfarm homes will go under construction in 1950 (disregarding seasonal factors). This would be 25% more than the 1,023,500 units started last year.

While some authorities say construction starts may taper off later in the year, there is no sign of it so far. In fact, private large-scale housing contracts in June are running 36% over the January-May average rate. And the January-May total at $1,322,790,000 was double the year before. ENR figures cover housing projects valued at $250,000 or more each. As of June 15, large-scale private housing contracts totaled $1,715,178,000—112% over 1949's 24-week total.

• **Building everywhere.** This year's record crop of private housing projects is double or more last year's in most regions of the U. S. But it is not spread across the country in relation to population distribution.

The Middle Atlantic States and Far West are getting much more housing projects than is their share of 1948 population. The South and New England are getting much less.

Housing Projects and Population

ENR contracts, 5 mos.

	thousands	% of U. S. pop.	% of ENR contracts
New England	$ 42,491	5%	3%
Mid. Atlantic	429,965	22	33
South	175,703	32	13
Mid. West	354,156	26	27
W. of Miss.	244,475	15	19
Far West	75,000	11	6
Total U. S.	$ 1,322,790	100	100

• **Public housing lags.** The 1950 housing boom is almost all privately financed. Public housing contracts the 24 weeks to June 15 are actually off 38% from last year. They total $106,827,000, compared with last year's $172,888,000 the first 24 weeks. (See ENR June 1, page 24.)

As of June 1, no federal-aid, low-rent projects had been started. But by August 1, 224,000 units will have been contracted. This is the estimate made by Public Housing Administrator John Egan last week.

Cement demand rises; supply seen tightening

Cement demand is now running so high that some mills are falling behind on orders. Only a few spot shortages have occurred so far, among them Texas, Florida, Ohio. But industry leaders say supply promises to tighten through the summer until about mid-September.

Universal Atlas has maintained all along that production and mill stocks will be adequate, but a shortage of shipping facilities will be the problem during peak demands. They advise their customers to schedule orders far ahead. If contractors all want cement at the peak of the season, the mills cannot load stocks fast enough to keep up with orders, and there is a shortage of the hopper cars used for rail shipments in bulk.

Pennsylvania-Dixie's Chairman Victor Rondeau says cement shortages will be about on the order of 1948. Penn-Dixie's production is taking care of present demands, but may fall behind in July.

Henry Crown, chairman of Materials Service Corp., predicts cement will be tight by August. He says shortages may be worse than in 1948.

Until recently, demand has been held down by rain, cold and muddy ground. Shipments of 18.4 million barrels in April were only 3% over last year, in spite of record contract awards. The industry produced at 85% of rated capacity in April, the same as a year ago.

Plywood in fair supply; price rises are varied

While there is not an acute national shortage of plywood, the supply will remain tight at least through July, and probably through the summer. Vacation shutdowns will slice output to nothing for two weeks in July.

As long as demand stays as high as it is now, the supply situation will not change much as the mills are already operating at capacity. All mills have heavy order files, and mixed sales offices are fat all over.

• **Price increases.** Plywood prices increased on most products about June 1. Interior grades went up 2½% to 3% to $87.00 a M, fob mill; special concrete form grades went up 6.8%, bringing 3/8 in. to $127 a M. Sheathing, however, has not changed price since February when it increased about 8½ to 6% or up $5 to $70 a M.

Brick, tile supply

Inventories of brick and tile are adequate, but orders should be placed as promptly as possible to assure delivery to meet construction schedules. This is the supply situation summarized by W. J. Cookson, president of Structural Clay Products Institute.

The institute has estimated structural clay products production this year will about equal the 1948 postwar high.

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 76, went to press.)

Assembly Plant—Johnson, Drake & Piper, Inc., has been awarded $10,000,000 contract to construct superstructure for foundry and boiler house at new assembly plant at Cleveland, O., for Ford Motors Co., Dearborn, Mich. Bids will be taken June 20, for motor assembly plant building also to cost $10,000,000 by Albert Kahn Associated Architects & Engineers, Inc., Detroit, Mich., consulting engineer E. A. Lichtbother & Co. and George Michle, Detroit, are engineers and architects.

Gas Transmission Lines—Lone Star Gas Co., Dallas, Tex., has authorized and financed a five-year program for gas distribution lines in Dallas area to cost $11,885,000 and in Fort Worth area $7,655,776.

Air Force Housing—Department of Air Force, Washington, D. C., has let contract to construct, manage and finance apartment building adjacent to Wright Patterson Air Force Base, Dayton, O., to Cowan Construction Co., Shawnee, Okla. Cost will be about $9,000,000. Hudgins, Bell & Thompson Co., Oklahoma City, are architects.

Turkish Airfields—Metcalfe Construction Co. and Gordon Hamilton Contracting Co., Inc., Kansas City, Mo., and Grace Shepherd, Wilson & Kingg, Inc., New York, have been awarded joint contract to improve 47 airfields in Turkey. Work, which is for Turkish Government, Ankara, will be under supervision of U. S. Engineer group attached to Joint Mission for Aid to Turkey.

New Jersey Turnpike—New Jersey Turnpike Authority, Trenton, N. J., received low bid from Francis A. Cuneo & Son, Philadelphia, Pa., at $1,747,280 for Contract 53, which involves arch, bridges, paving and incidental work for Section 2, New Jersey Turnpike in Gloucester, Camden and Burlington Counties. Gannett, Fleming, Corddry & Carpenter, Harrisburg, Pa., are consulting engineers.

Lower Lock & Dam—A. Johnson Construction Co., Minneapolis, Minn., and Peter Kiewit Sons' Co., Omaha, Nebr., were low at $5,308,005.50 for Lower Lock and Dam at St. Anthony's Falls in the Mississippi River near Minneapolis, Minn. when U. S. Engineers, St. Paul, opened bids June 13.

Power Plant & Transmission Lines—Toledo Edison Co., Toledo, O., awarded contract for 75,000 kilowatt turbine for Acme Station, Toledo, to General Electric Co., Schenectady, N. Y., and a steam generator and boiler to Babcock & Wilcox Co., New York, N. Y. Total estimated cost is $9,500,000. Toledo Edison also plans new transmission and distribution lines, sub-stations and service facilities in northwestern Ohio to be installed during 1950 and 1951, to cost about $4,000,000. F. W. Melver, Toledo is company engineer.

Housing—I. M. Pickle and Ogden Klein, San Antonio, Tex., plan housing in San Antonio which will cost about $5,400,000. Owners will make own plans and project will be constructed in four sections.

Roads—Pennsylvania Turnpike Commission, Harrisburg, Pa., awarded section of turnpike in Allegheny County to Harrison Construction Co., Pittsburgh, Pa., at $2,422,071. Gannett, Fleming, Corddry & Carpenter, Harrisburg, are consulting engineers.

Office—Anglo-Norcross Ontario, Ltd., Toronto, Ont., will construct office addition in Toronto for Manufacturers Life Insurance Co., Toronto. Estimated cost is $3,000,000. Mitam & Morris, Toronto, are architects. Dominion Bridge Co., Toronto, will supply and erect structural steel.

Apartment—Queens College Gardens, Kew Gardens, N. Y., will build an apartment in Kew Gardens by own forces. Cost is about $4,000,000. Pinto & Mrs. Brackin, N. Y., are architects.

Hospital—Episcopal Diocese of Los Angeles, Los Angeles, Calif., will soon let contract for hospital addition to cost $3,000,000. Samuel Lunden, Los Angeles, is architect.

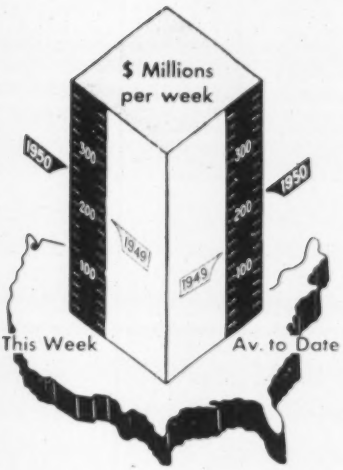
Sewage Treatment Plant—Merritt Chapman & Scott Corp., New York, N. Y., has been awarded contract for 15,000 mgd sewage treatment plant at Rockaway, N. Y., by the New York City Department Public Works, New York, N. Y., at $3,748,000. Metcalf & Eddy, Boston, Mass., designed the plant in cooperation with the owner. Charles Comere will be resident engineer for contractor and Joseph Sitoff will be city's project engineer.

Shopping Center—Stanford Construction Co., Washington, D. C., will build shopping center at Chillum, Md., by own forces at about $5,000,000. Cramer & Moore, Washington, D. C., are architects.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index	Base	1949	1926
Construction Cost	June 20 '50	245.45	243.45
Building Cost	June 20 '50	232.36	261.61
Volume	May 20 '50	184	268



Activity This Week

As reported to ENR (in millions of dollars)

Amount of contracts let

Week of	This Week 1950	Cumulative 1950 wks-1	Cumulative 1949 wks-1	% chge
June 22	$25	$25	$25	0
Federal	$ 8.0	$ 65.2	$ 22.2	193
State & Muni.	$ 8.6	$ 42.9	$ 43.6	-1
Total Public	$ 11.6	$ 220.1	$ 131.0	68
Total Private	$ 13.6	$ 295.2	$ 174.0	70
U. S. Total	$ 256.2	$ 515.3	$ 305.1	69

Contracts by type of work

	This Week 1950	Cumulative 1950 wks-1	Cumulative 1949 wks-1	% chge
Waterways	$ 1.5	$ 14.1	$ 4.1	244
Highways	3.0	72.0	12.0	500
Bridges	3.0	28.1	16.0	76
Heavy Engr.	2.1	42.1	38.2	10
Earthwork, Drainage				
Waterworks	10.5	22.8	25.5	-11
Sewerage	13.1	80.2	38.4	108
Housing				
Public	2.8	11.2	19.0	-41
Private	8.2	128.6	63.2	103
Industrial	2.6	17.2	10.2	69
Commercial	2.6	45.2	20.0	126
Unclassified	12.8	146.6	120.5	22

New capital for construction

	This Week 1950	Cumulative 1950 wks-1	Cumulative 1949 wks-1	% chge
Corporate securities	$ 104.0	$ 1,225.6	$ 1,225.6	0
Bonds and Mortgages				
Total Industrial		166.0	144.1	15
Housing		228.1	111.1	105
Total Capital		$ 1,619.7	$ 1,480.8	9

Compromise possible on local road aid

MacDonald OK's provisions specifying that part of federal funds go to county roads in secondary system

A novel proposal to direct more federal aid to county roads—without disturbing present federal aid procedures—came before a Senate Public Works subcommittee during the last two days of hearings on the highway bill (ENR April 27, p 24). Commissioner Thomas H. MacDonald, of the Bureau of Public Roads, told the committee he could see no objection to specifying in the legislation that a certain portion—possibly 50%—of federal aid funds for the secondary system be spent on county roads included in that system.

That was the gist of his suggestion. Actually, the legislation would have to be written so as not to hamper federal aid for secondary roads in those states that have absorbed most of the local routes into their state systems. Further, to take care of states where towns or townships have jurisdiction over local roads, the language would have to apply to political subdivisions in general, rather than to counties in particular.

• **Much to secondary roads**—But these details are purely technical. It was noted, the proposal would assure the spending of a good share of federal aid on secondary system roads that are under local jurisdiction. On that basis, the suggestion had strong appeal for the Senators—Kerr, of Oklahoma; Stennis, of Mississippi; Young, of North Dakota; and Thye, of Minnesota—who have been urging a separate federal aid fund for specific benefit of the counties, as set up in the Chavez highway bill.

Chief advantage of MacDonald's approach would be retention of the present line of responsibility for roads in the secondary system. Control over additions to the system and over improvements to the roads is centered in the state highway departments, subject to approval by the Bureau of Public Roads.

The chain of authority has worked well in many states, but in other places the counties have complained that too little of the federal aid allotment is spent on their parts of the secondary system. They have also criticized the standards for secondary roads as requiring excessive construction costs. The local road section of the Chavez measure proposes to dispense with nearly all the state and federal controls, passing only the money to the local authorities for spending at their discretion, a move normally abhorrent to federal officials.

ALUMINUM WALLS—Ames, Iowa, municipal power plant has a welded steel frame and 16 gage exterior wall panels of aluminum. Interior panels are 17 gage steel. Three in. of glass wool insulation separate them. Burns & McDonnell Engineering Co., and Interstate Construction Co., both of Kansas City, Mo., were designer and builder.

• **200,000 mi of county road**—Of some 400,000 miles of roads on the federal aid secondary system, about half are in the county road category. Under present procedures, it is admitted that in some states these county roads may have received less than a fair share of federal aid. The new stipulation suggested by MacDonald would correct any inequities of this kind.

Tentative acceptance of the proposal by the local roads supporters in the Senate indicates that the suggestion may satisfy them. In that event, it could avert a fight over the more radical provisions in the Chavez bill, which would separate district from federal aid police. Unless the Senators hear loud objections from the counties in their home states, they probably will be ready to approve a plan such as Commissioner MacDonald suggested as a means of avoiding delay on the bill.

Cofferdam break hits dam

Six to eight weeks delay was caused at the Reclamation Bureau's Canyon Ferry Dam, near Helena, Montana, when an upstream cofferdam was broken. The construction area was flooded, as power shovel and pump submerged. Some roadway also was washed out. Cause of the break in the cofferdam is unknown, project officials said.

New York council OK's sewer rental charge

Rates set at third of water service fee to support $100 million program—Los Angeles council kills proposal

The New York City Council has approved a law instituting a new sewer rent amounting to about one third of the existing water fee. It must be signed by Mayor O'Dwyer.

In Los Angeles, though, city council voted down overwhelmingly a sewer rent schedule based on a 75-cent monthly charge upon private homes.

New York expects revenues of about $15,000,000 yearly from its new charge. These funds would be used not for maintenance, management, operation and repair of the sewer system. The surplus, estimated to be a substantial portion of the fund, would go to service existing sewer debt and to build new treatment plants.

The sewer rental charge benefits the treatment plant program in another way. It makes it possible to consider sewage treatment as a self-sustaining operation, thus placing any necessary capital borrowing outside the city's legal debt limit.

Passed with the new sewer rent bill was another which cancelled certain city-wide assessments for sewage treatment plants and which eliminated assessments scheduled to take effect in the 1950-51 fiscal year. The canceled assessments totalled more than $40,000,000. They had been levied to support the city's five-year, $100 million sewage treatment plant program.

One of the angles of New York's new law is that it will levy charges against commercial, industrial and exempt users who do not now have any direct share in the cost of sewage service through real estate taxes.

Only one dissenting vote was cast against the New York program. It was based on the contention that only about half the proceeds would go to the new plant program.

• **Hyperion involved**—The Los Angeles proposal had the support of the mayor, the Board of Public Works and council's finance committee before council turned it down. It had been proposed by City Engineer Lloyd Aldrich to raise money for operating costs of the city's new, $41,000,000 Hyperion treatment plant. The proposed schedule would have raised almost $6,000,000 yearly, part of which could have gone for new outfall sewers.

The charges ranged from 10¢ cents monthly for hotel rooms to $110.27 for commercial and industrial customers, depending on meter size.

Meanwhile, Aldrich told council that Hyperion would operate at capacity in 1953.

Paving irregularities exposed in Boston

Finance Commission reports on four investigations — Asks repayment of $83,500 on three contracts

Street paving scandals have been a steady diet for Boston newspaper readers this year. Disclosures in four reports of the Boston Finance Commission (ENR 6 p 69) are watchdog have brought the construction and city department and paving contractors generally.

1. Mayor John B. Hynes has established a blacklist of contractors who, he believes, have misled the city.

2. The paving division of the Public Works Department has been made a part of the bridge and highway division.

3. The department is checking paving throughout the city.

4. Paving recently finished this year will be tested by a vibrating machine before final payment will be authorized.

5. A complete new system of inspection reports is being planned.

6. The Finance Commission is checking each of the 145 streets attested by the $3,465,305 paving program performed last year.

Thompson & Lichtner Co., Inc., has been retained to inspect construction and all material is inspected as it leaves the plants for job sites.

• **Three refunds sought.** In three of its four reports to the mayor, the Finance Commission, as it is known in Boston, (ENR March 11, 1948, vol p 391) has protested items totaling $83,588. In a fourth it is stated that the work was done, but it asserts that $6,500 of it was never authorized. It adds that:

"The whole manner of obtaining performance under this contract was so grossly irregular that in the end the officials resorted to falsification of the records in order that the contractor might be paid."

One contractor has promised to repay $40,041 all the way to $2,000. Another ordered to repay $829 has not as yet $4,674 payment or completed the job as specified, has indicated he'll let the courts handle it. A third has been ordered to refund $5,407 of a $42,843 payment on the grid out.

Fin. Com.'s investigation is by no means complete.

Study of the four reports discloses everything from sloppy performance to admitted falsification of records. In numerous cases, layers of pavement of subgrade material were found to be thinner than specified. Poor penetration of asphalt was reported several times.

Inspectors often were given verbal assurance of the quality of orders which could not later be authenticated in writing. In other cases, records are missing. In one case, work was done which was not authorized, and in numerous cases, work which was authorized wasn't done, even though paid for.

Contractors' Routine checks are ordered to be made and action taken against contractors suspect for failure to make the specified tests.

• **Not enough rebuilding.** The 1949 program of $3,465,305 [illegible] for the 265 streets averaged 3.6% of the entire road mileage has been rebuilt, or about 1 in 30 years. Action points out that such a rate implies complete reconstruction in 30 years, but that the pavement life is placed at about 20 years under favorable conditions.

With $11,27,384 expended on streets and sidewalks in the past five years, Fin. Com. added, Boston's streets are actually worse. It charged that [illegible] practice not only ignores street [illegible] and [illegible] these other items continuing to wear streets. Heavy traffic frequently [illegible] delay in clearing [illegible] streets and [illegible] brought an abnormal shortage [illegible] and [illegible] [illegible]

SAFE STAIRWAY—Line Material Co. wanted a completely safe stairwell for its new Milwaukee office building. These fluorescent lights help. Flues extend more than 40 ft from basement to roof, are supported only at the ends and are controlled by remote anvilaires. Single-pin tubes are mounted on aluminum tubing. Maynard W. Meyer, Milwaukee architect, and Ari Waitz, lighting consultant, designed the installation. Northern Light Co., Milwaukee, made the fixtures. (Milwaukee Journal Photo)

Long-term contracts gaining in Far West

Two and three-year labor agreements OK'd in California and Salt Lake City—They include raises at intervals

The trend in construction labor negotiations in the far west is toward long term contracts.

Three-year agreements have been signed with carpenters in the San Francisco Bay area and with six basic construction trades in Salt Lake City.

Two-year agreements are prevalent for other trades and in other areas.

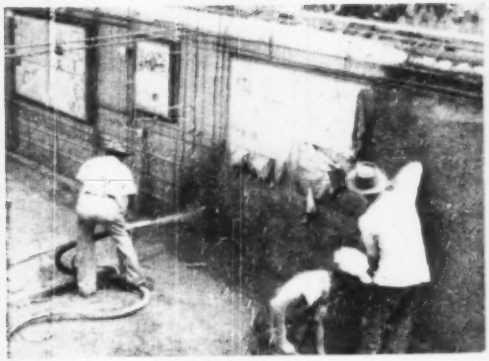
Arizona unions asked contractor groups a five-year contract that includes a 5¢ an hour annuity improvement factor and General Motors type cost-of-living adjustments. Negotiations there are still under way, but it is generally conceded that the result will be a long term agreement.

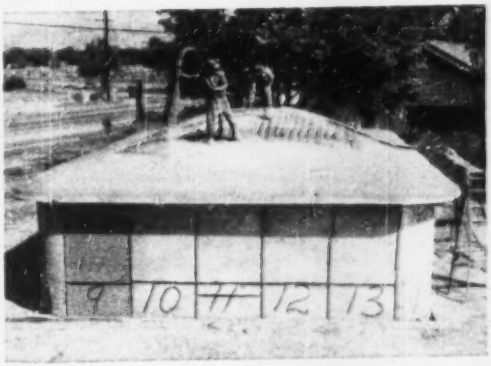
• **Salt Lake trouble ended.** The Salt Lake City agreement came after a threatened strike against two jobs resulted in a general lockout by contractors in the area. The only benefits gained were wage increases. During the life of the agreement, workers get the following hourly increases (includes common as well as skilled labor: July 15, 1950—10¢; Jan. 1, 1951—2¢; June 1, 1951—5¢; and June 1, 1952—10¢). It has a no reopening clause.

The San Francisco carpenter's agreement, effective in four Bay area counties, was signed early in June. Increases granted are July 15, 1950—10¢; July 15, 1951—7¢; and July 15, 1952—7¢. Of importance in this contract are clauses specifically prohibiting strikes and lockouts and preventing either party from making new or additional demands during the term of the agreement. The latter is aimed at countering a recent ruling by the National Labor Relations Board. In ruling on a meatpacking case, NLRB said, in effect, that unless there were specific provisions in the contract to the contrary, new demands and strikes required only 60 days notice.

• **Stability sought.** The purpose of these long term contracts is to achieve stability in the construction industry. By tying things down for two or three years, contractors can prepare bids with confidence as to stable labor cost. Under the old system of annual negotiations, no contractor was secure against increasing wage rates.

Another purpose of such long term agreements is to sidetrack union demands for new benefits, such as pensions that are unusual to the construction industry. In a three year period, a noted trend on session agreements in all industries will the negotiations hope, be fairly well crystallized.





HOUSING, NEW STYLE—A California firm is building 750-sq ft bungalows in 12 hours by spraying concrete over removable steel forms and an inflated balloon. Bolted forms are erected first for the outer wall, room partitions and floor. Window and door frames are bolted to forms. Welded wire mesh is tied to the forms to fall midway in the 4-in. concrete wall. Atop it ride 2-in. reinforcing bars. The whole assembly is covered with a 4½ to 1 concrete mix applied pneumatically. Quick-set and waterproofing additives are used. The concrete is shot from the inside out, partitions first. When it has set sufficiently, a wood platform is erected on the walls. A synthetic-coated, nylon balloon is tied to the walls and inflated. It gets a 14-in. layer of concrete, a layer of 6-gage mesh and another 14-in. layer of concrete. Within seven days, the roof can withstand 3,000 psi, almost double that in 28 days. Comm Sales, Inc., expects to build the homes for $5 per sq ft. L. E. Town is engineer, W. J. Bolusch consulting engineer. At left above, walls are being formed; at right, the roof. (Wide World Photos)

Winnipeg flood costs $26 million

Greater Winnipeg was approaching normality again by mid-June. On June 10, the level of the Red River within the city area was down to about 18.8 ft on the city gage, normal flood level for the city. At this stage, no city property still remains under water.

As the two-month emergency period came to an end, reconstruction and compensation followed. Financial arrangements for payment for the flood damage were disclosed in the headlines.

In Ottawa June 9, Finance Minister Abbott announced to the Canadian House of Commons that the federal government would contribute $12-million to the Manitoba government as partial and initial payment for the direct flood damage to property and for the cost of flood fighting.

The figure was based on the interim report of the joint Dominion-Provincial Commission, set up to estimate the total direct cost of the flood. Engineer J. B. Caswell and Investment Banker Bruce Shaw, had completed their investigations and had submitted a report in which they concluded that the direct cost of the flood was $26,651,650. This figure excludes damage to personal property, such as furniture and clothing, and also crop losses. It does not attempt to assess indirect flood losses, even though these were great.

• **Lower than estimated**—Missing every allowance for these additional sums, however, the estimate of flood damage is very much less than all earlier figures had suggested. Major items in the Caswell-Shaw summary are as follows: Flood fighting, $7,000,000; damage to public utilities, roads and highways $3,000,000; damage to homes, $7,500,000; damages to business buildings, $1,500,000.

The federal government, above announced by Abbott will bear 75% of the cost of protective diking. This was done in British Columbia at the time of the 1948 flood on the Fraser River.

Quick reaction to the action of the federal government came in Winnipeg. There Provincial Premier Campbell said that he could not express complete satisfaction with Ottawa's initial $12,500,000 payment because it does not meet Manitoba's immediate needs. Campbell complained that Abbott's statement gave no definite assurance as to the total federal help which would be available for the vast rehabilitation program.

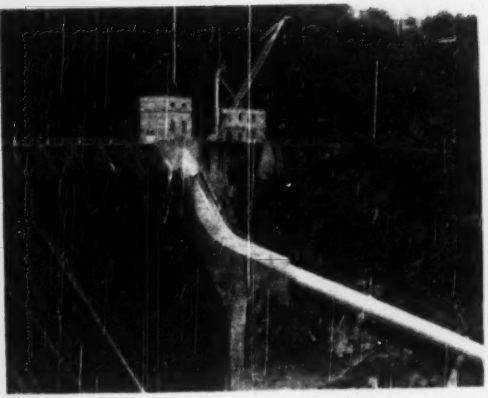
Campbell added that the province's own estimate of the damage was $50,000,000. He said that the province's estimate of the Caswell-Shaw Commission did not include many items of loss which Manitoba regards as worthy of most serious consideration by the federal government, such as loss of revenue to municipalities, loss on personal property and many others.

• **Plants to operate soon**—The Canadian Manufacturers' Association has announced that a survey found that nine-tenths of Manitoba's industrial plants were affected by the flood waters. All plants will be operating normally again within the next two weeks.

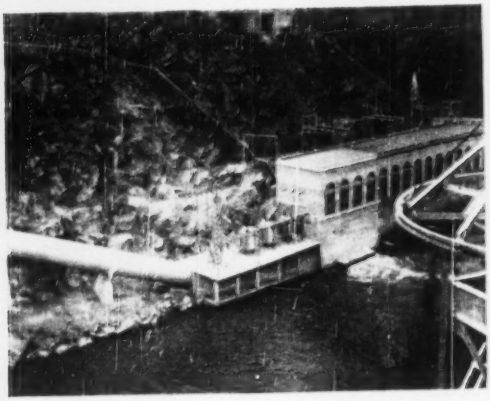
The provincial rehabilitation commission has announced that 10,400 homes on the Red River and in Greater Winnipeg were flooded. More than one-third of them had water above the first floor. A recent inspection showed that most of the homes were damaged by immersion only. In Morris, midway between the international border and Winnipeg, and in the area to the west of it has occurred the only serious structural damage to houses.

Many way at the widest part of the flooded valley. Winds blew constantly from the northwest, and as they came over the 30-odd miles of shallow water they whipped up waves which reached five to six ft in height. These waves, aided by floating debris and by a number of power poles which broke loose, wrecked a number of homes and farm buildings so badly that they will have to be rebuilt before further use can possibly be made of them.

No serious damage appears to have been caused to major highways or railroad bridges, and all main roads are still serviceable. Railway service on all lines affected by the flood has now been resumed, following continuous serving work by Canadian National gangs in particular. C.N.R. lines having been most seriously affected of all the lines which serve Mr.



FROM INTAKE TO DISCHARGE the new 30,000 kw unit at Cheoah Dam is independent of the four older units. Its all-welded penstock leads from a converted flood gate atop the dam to the extended plant below.



Old Hydro Plant Gets New Unit

A FLOODGATE was made an intake. A penstock was built down the face of the dam. And a fifth unit—completely independent of the previous four—was added to a 50-year-old hydroelectric power plant in North Carolina.

One third more peak-load power—30,000 additional kw—thus was made available from the Cheoah development of Carolina Aluminum Co. on the Little Tennessee River. Except for short shut-downs on two consecutive Sundays for making high-tension connections, the new unit went on the line without disturbing output.

• Change in operation. The original run of the river plant had only three units; the fourth was added in 1927. All four are fed by a 27-ft-diameter tunnel that runs 450 ft from above the dam to a point abreast of the powerhouse, where it divides into four parallel, 15-ft 6-in.-dia. tunnel-type penstocks. Head on these and the new unit is 188 ft.

Flood waters coming down the narrow gorge used to flow over the 230-ft high spillway dam. But now, Fontana and Santeetlah dams are upstream to reduce flood. Also, the Tennessee Valley Authority now load-dispatches the Cheoah development, coordinating its output with peak-load operation of the upstream plants. The fifth unit at Cheoah was added to fit the plant better into this system of water and power regulation.

• Unit 5 features. Installation of the added capacity was marked by simplicity. No tunneling was done; the dam suffered but little alteration; something new in trash racks was developed; and original lines of the powerhouse were preserved, even though the added unit is larger than the old ones.

The intake is a converted flood gate. Originally, there were 20 of these, each with a steel tainter gate for control. Now there are 19. The southernmost gate on the 750-ft long dam now has a fixed-roller, gravity-operated intake gate installed inside a gatehouse atop the dam. It is operated from the powerhouse below.

• Bucket trash rack. Instead of radically altering the top of dam to install a conventional trash rack in front of this intake slide gate, designers fashioned a cage-like trash rack—a semi-cylinder of grating that hangs right from the upstream face of the dam. It can be reached and lifted by the same stationary derrick that services the nearby tunnel intake of the old power unit. And it can be lifted easily and set on top of the dam for cleaning and painting.

Carolina Aluminum Company is a subsidiary of Aluminum Company of America. So Alcoa engineers did this design. J. P. Creedon, chief hydraulic engineer, says the trash rack is so satisfactory that he would use no other where this type will work.

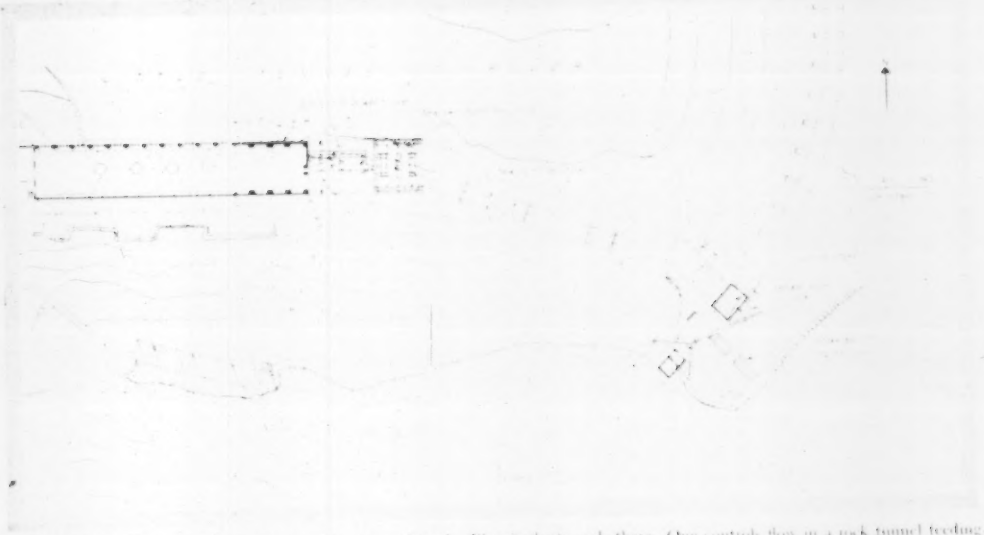
In plan the new rack has a five-sided shape. It measures 31 ft along the face of the dam and about 14½ ft upstream from the face. Its five vertical sides have a height of 28 ft.

Framing is of 5-in. I-beams and lighter, 2x4-in. bars form the grating; the structure is all welded. Vertical grating on the sides is spaced on 4½-in. centers outside of horizontal bars spaced each 2 ft 5½ in. Bottom grating is a similar grid. The whole rack has a net open area of 1,100 sq ft. Steel framing at the top of the rack supports an open timber decking placed in spaced-web design. This work surface is accessible from the top of dam.

Two 1½-in. square rods act as lifting sling for the trash rack. The rack is hung on projecting ends of two 8-in. channels embedded in the dam. To increase friction between rack and dam, the uncurved steel surface of the rack was roughened with spot welds of ½-in. diameter, ½ in high, spaced 3 in. each way.

• Penstock design. Only minor concreting was needed at the crest of the converted overflow spillway to give it proper curvature for penstock intake flow. The unwatering caisson for periodic painting of tainter gates was used to dry the converted gate during construction. The penstock itself starts out as a 17-ft diameter concrete conduit running down the face of the dam. It runs some 57 ft at a 12-on-8 slope, then curves into a 1-on-2.64 slope for the remaining 55 ft of its concrete enveloped portion. The rest is steel—all welded—17 ft in dia for 272 ft and 16 ft in dia for 103 ft of its length.

Formed steel plates ¾ in. to 2 in.



OLD AND NEW INTAKES are both at dam's south end. The similarity ends there. One controls flow in a rock tunnel feeding four old turbines, the other feeds one turbine through a new steel penstock.

thick were delivered to the job and hold butt-welded into pipe to take 12,500 psi ring tension. The spiral case, too, is of shop formed, field-welded steel plate; no rivets were used. Construction of the entire turbine showed a marked trend toward fabrication instead of casting of steel for this type of machine.

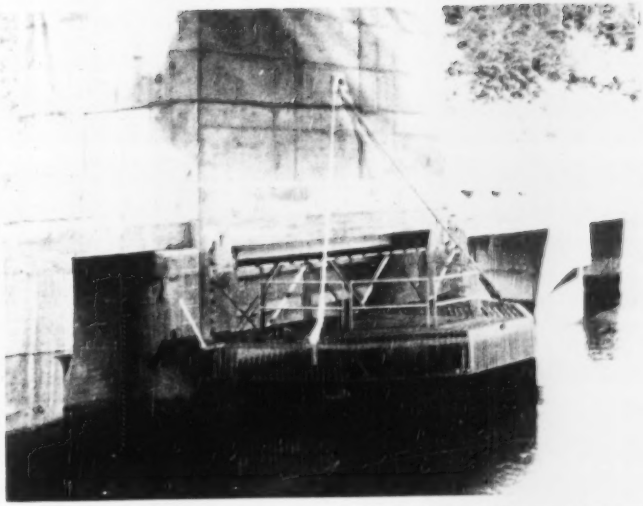
• **Powerhouse extension** To house the new unit, the powerhouse was lengthened 71 ft 6 in. Reinforced concrete framing was used at the extension since steel supplies were critical at the time. The new section was made no wider than the old, but instead of a 6-ft thick foundation wall, pilasters and curtain walls were poured to give maximum interior space around the larger unit. The turbine was set lower than those existing, and the generator was set close down on it so that overhead clearances would be no problem. The overhead traveling crane was reinforced to carry the heaviest loads of the new unit on its 45-ft span.

Outside the building's new end, an entirely independent switchyard, with all-aluminum structures, was built to serve the new unit.

With its individual intake, penstock, switchyard and transformer equipment, the new unit is completely independent of the four old ones. Thus the development now has two distinct sources of power, each capable of operating without the other. This means the old tunnel, in constant use since 1919, can now be unwatered and inspected while the new 50th unit continuously puts out 56,000 kw. The old gate at the tunnel intake never have been serviced.

Chicoh was the first large hydroelectric development in the area and played an important part in early industrialization of the Knoxville region. When built, the concrete gravity structure achieved the then-highest overfall dam in existence. Model test methods of design developed from this project for prevention of foundation undercutting are still in use today.

Hinwood Construction Co. of Pittsburgh and Maryville, Tenn., was prime contractor. Allis-Chalmers Mfg. Co. provided the turbogenerator, Mahoney Electric Co. manufactured the transformers. Chicago Bridge & Iron Co. constructed the penstock. Design and construction of the project were under direction of J. P. Snowdon, chief hydraulic engineer, Aluminum Company of America.



BASKET TRASHRACK hangs at new gate house, protecting intake for added unit. It is easily cleaned or lifted out for maintenance.

Kansas Seeks More Durable Pavements Through Use of "Old Fashioned" Cements

W. J. Arndt

Assistant Engineer of Materials,
Kansas State Highway Commission
Topeka, Kan.

THREE CONTRACTS awarded this spring by the State Highway Commission of Kansas may revolutionize the art of concrete paving in that state from the standpoint of design, materials proportioning and construction techniques.

All three projects have a common objective: to prove that a tougher and *more durable concrete* pavement can be secured by specifying the use of a coarse-ground cement and by requiring modifications in methods of construction. The three projects (see table) involve a total of 23.1 miles of 24-ft concrete pavement on highways now carrying considerable traffic, including heavy trucks.

Materials and design details of each of the three projects are identical, so is the layout of the various sections, thus making possible a comparative study to determine the efficiency and service life of the pavement under varying conditions of traffic and weather.

Three-fourth of the concrete pavement in each project will be made with a coarse-ground cement. This cement is a reproduction, as nearly as possible, of the so-called "old-fashioned" cements produced in this area in the 1920's. The remainder of the pavement in each project will use cement currently produced by Kansas mills, which is classified as Type I, is finer ground, and will be referred to as "modern" cement in this article.

Investigations to be conducted on the three paving projects are, in reality, an "extension of study" started 10 years ago by Kansas engineers under the direction of R. C. Keeling, chief highway engineer. From 1940 to 1944 a thorough study was made of 1,270 miles of the 1,320 miles of concrete pavement then in service.

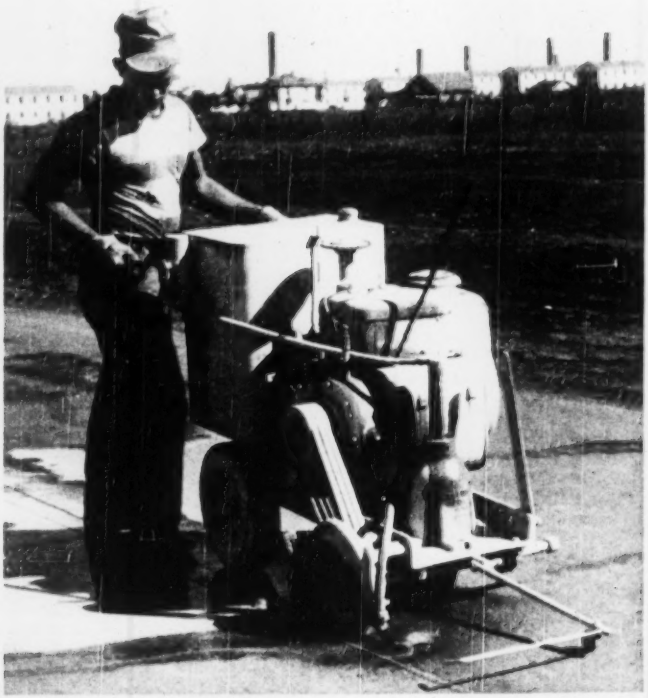
• Old pavements are tougher. The survey revealed that, in general, concrete pavements constructed prior to 1930—even though structurally cracked—had a tougher fiber and a better soundness than many built since.

Modulus-of-rupture tests on 6x6-in. slabs from these typical pavements revealed a similar trend in strength. Many of the older pavement—some 25 years old—still possessed a modulus of rupture exceeding 1,000 psi. By comparison, test slabs removed from a large number of 8-yr old pavements had a strength of less than 500 psi. These strength comparisons were more remarkable since the newer pavement had been built by improved methods of controlling the concrete mix.

Materials and construction methods being used on the three paving projects are not based on theory alone nor solely on laboratory experiment. They are the result of remedial measures adopted by the department at the beginning of its postwar concrete paving program, also the result of the "Topeka Test Road," built last year.

• New methods required. Salient design and construction features of the Topeka test road, incorporated in the three pavements now under construction are:

1. The adoption of a mechanical tamper in lieu of a vibrator for pavement consolidation. Specifications for this tamper have been tightened considerably to provide more positive tamping and better consolidation.
2. A minimum cement factor of 1.60 bbl per cu yd.
3. Contraction joints to be cut with a concrete saw.
4. Elimination of all types of curing other than the initial 24-hr moist burlap, followed by 20 days of wet earth curing.
5. Redwood boards for forming expansion joints in lieu of fiber expansion



MOST CONTRACTION JOINTS are to be cut part way through the slab with a concrete saw to eliminate the surface defects that develop at hand-formed joints.

material because of their substantial character.

6. A change in the finishing methods of concrete pavement more in line with the 1924 delayed-type of finishing.

7. Steel rollers for consolidation of the concrete and removal of laitance where coarse-ground cement is used.

As a result of the 1944 condition and physical survey of existing pavements, plus a brief survey made last year, together with results of the Topeka test road, the State Highway Commission of Kansas desired to further explore the use of coarse-ground cement. The cements that seemed to hold considerable promise were similar to the "old-fashioned" cements. Thus, a modified coarse-ground cement (surface area about 1,375 sq cm per gram) was specified for the three projects this year. The location of these projects also affords an opportunity to study the use of these cements over a wider area of materials, traffic and climatic conditions.

• **Materials requirements**—The following are the more pertinent requirements of the materials, equipment, and construction methods which are specified for the three test roads:

Aggregates are the single type of "total aggregate" (a natural sand and gravel mixture that is deficient in coarse material) sweetened with approximately 25% of crushed limestone. Where the Topeka project made use of the normal coarse and fine aggregate combination, these projects will evaluate the total aggregate type which, for economic reasons, are essential for use in the western part of the state. An increased quantity of fines (minus 50 mesh) also is required.

• **Cement composition**—The difference between the regular Type I cement and the modified coarse-ground cement lies principally in three factors. The tricalcium content, fineness, and the amount of free lime. The modified coarse-ground cement is limited to a maximum of 42% tricalcium silicate. This increases, without specific limits, the dicalcium silicate.

The purpose behind this requirement is two-fold. First, with the 20-day curing period it is not essential that the concrete gain an immediate high strength. In fact, it is believed that the durability of the concrete will be improved if the strengthening processes are slower but continuous. Second, the increase in dicalcium silicate—a delayed but long-time strength-gaining compound—provides the cement with a property which seems to have been neglected in the recent past. It was this retention of high strengths over the years that was so remarkably present in the older cements.

The later cements which were fine-ground and in which the dicalcium silicate content was considerably lower than those of the 1920's, revealed modulus-of-rupture values which, in many instances, were less than those at the time of construction. Many authorities agree that this better balance between the tricalcium silicate and dicalcium silicate will be conducive to more durable concrete pavements over a long period of time.

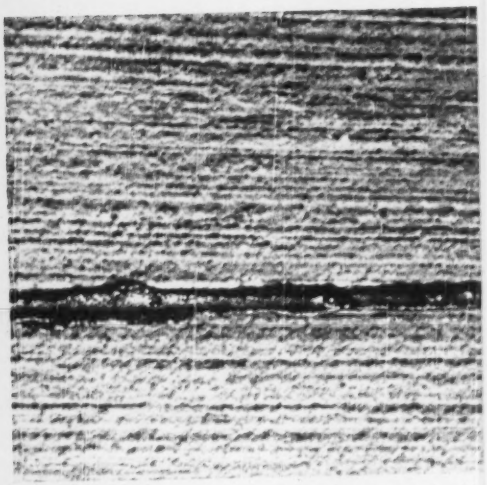
The fineness, as determined by the Wagner turbidimeter, is specified to have maximum average value of 1,500 sq cm per gram. Thus, it should be noted, is a maximum average value. The actual surface areas are expected to vary from 1,200 to 1,400 sq cm per gram, as contrasted with the normal 1,700 to 1,800 fineness values.

The objective here also is two-fold. The highway commission's engineers are seeking a cement which will continue to gain strength as it ages instead of one that will gain high strength early and thereafter fail to continue this gain. By having a coarser ground cement, they are providing coarser nuclei to be acted upon at a later date with periodic moisture applications. This cement, from our experience on the Topeka test road, will be fine enough to attain a satisfactory strength in 20 days for release to traffic. Yet there will be sources both in the particle size and in the dicalcium silicate that will continue to provide strength gains over a long period of time.

• **Bleeding is good**—Moreover, it is believed that bleeding such as is attendant to coarse-ground cements is not harmful but actually can be beneficial, providing that the layer of laitance is removed and not left on the surface. This laitance is being removed by a steel roller which also aids in consolidation.

The coarse-ground cements, which were used on the Topeka test road in 1949, showed a loss of 8 to 12% of the mixing water, by bleeding. This naturally lowers the water-cement ratio and thereby produces a stronger concrete. Such bleeding permits the concrete to set in a more normal manner; the bottom portion of the slab becoming hardened first. Coincident with

A STEEL ROLLER, operated by hand, is used to remove water and laitance and to consolidate the surface.



CONTRACTION JOINTS are provided at 20-ft intervals. Three out of every four are saw cut (left) after the concrete has set to minimize damage resulting from the irregularities of hand forming (right).

the setting up of the lower portion of the slab, the center is becoming hardened and the top is still plastic. The reverse situation has been found to be true in pavements built with the finer ground cements.

On free lime content in the clinker is limited to a maximum of 1% by weight. The object of this is twofold. In the first place, small amounts of free lime tend to create unsoundness when the cement is more coarsely ground. And, it has been observed that some of the finer ground cements, while not unsound by any measure at the time of construction, have indicated a tendency to show a delayed unsoundness. This has been manifested in the mortar of many Kansas pavements possessing a white-flower appearance instead of the steel gray appearance of an older concrete.

The remaining requirements are essentially those of ASTM governing the autoclave expansion of the, the time of setting and the other chemical requirements for Type II cements. Strength acceptance tests are being based on ASTM requirements: 250 psi at 7 days and 325 psi at 28 days.

These cement requirements are slightly modified from those used on the Topeka test road, but since the principal features are retained, it is anticipated that they will perform in a similar manner to the "old fashioned" cements used last year.

Many authorities who have received these specifications agree in the end results to be achieved. None has expressed concern that they were not conducive to good results. However, the State Highway Commission is still experimenting with the use of this modified coarse ground type of cement and is not yet advocating its use by others nor pretending to consider it as its own.

• **Cement factor.** The minimum cement factor of 1.65 bbl per cu yd is being retained for use on these projects. There has been evidence that insufficient cement was one of the causes of rapid deterioration but not the sole cause. In order that no point be overlooked, it is felt that this safety factor should be kept.

This is especially true because of the use of coarse ground cement which requires a large quantity to produce adequate strength at 28 days.

• **Tamping believed better.** Internal vibration is prohibited, except adjacent to the side forms. Instead of the vibrator, Kansas requires a huge, heavy tamper on the finishing machine, operated by positive means, to provide a penetrating stroke of 1 to 2 in. on the surface of the pavement. The tamper is 4 in. wide and applies at least 9 blows per linear foot of travel while the finishing machine is in forward motion.

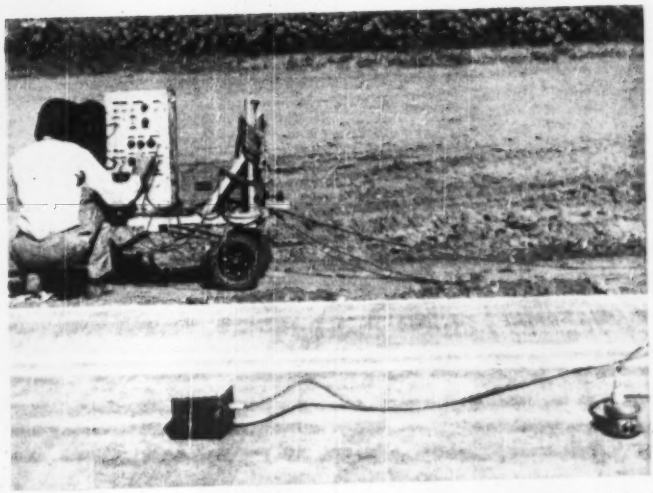
There has been evidence that the vibrator has a tendency to segregate the mix and collect an excess of unneeded mortar on the top surface which may scale off later. We are not using an extraordinarily dry mix on these projects such as has been recently advocated, but a mix tending toward the dry side of plasticity.

A special, smooth-surfaced steel roller is required to be operated transversely across the pavement after the passage of the finishing machine as long as bleeding continues. It is 10 ft long, 18 in. dia and weighs not more than 100 lb. The specific purpose of the hand-operated roller is to aid in surface consolidation and remove free water and laitance.

• **Expansion joints.** Expansion joints ½ in. wide are filled with Redwood or an expansion-board grade. They extend for the full depth of the pavement, less 1 in., to provide an equal amount of three projections from each

FACTUAL DATA ON KANSAS' THREE TEST PAVEMENTS

Project	No. 1	No. 2	No. 3
Location	US-281 (Great Bend)	US-40 Russell	US-50S (Dodge City)
Length			
Traffic Count (24-hr. average):			
Cars and light trucks			
Heavy Trucks			
Starting date (1950)			
Completion date (1950)			
Ext.			
Contractor			



NON DESTRUCTIVE TESTS of concrete are to be made during a long period of time to determine the long-time gain in strength that is anticipated.

• **Contraction joints** Contraction joints, 2 in. deep and 3 in. wide, are spaced 20 ft apart. Every fourth joint is hand-formed to prevent irregular cracking during the setting up process. The others are cut with a saw, any time after light age up to 20 days. The joints must be cut, however, before the earth cures, since it has been found that sudden drying shrinkage takes place upon the removal of the earth cure. Eventually it is hoped to cut the expansion joints with a concrete saw, but until we have had more experience which we hope to gain this summer, we shall continue hand forming.

Both the contraction joints and the expansion joints are sealed with either a thermoplastic compound or a plastic cold poured material of more recent development. Joints characteristic similar to those of the last pointed out.

As a result of the Topeka test road, extreme care is given the finishing operations. They are delayed as long as possible, up to two hours after placing concrete made with the coarse ground cement. This interval permits the water gain to occur, causing the concrete to expel all the water it does not need. The surface texture is obtained by a drag belting, with the burlap belt operated over the surface just before the concrete takes its drying set.

• **Concrete curing** Great attention is given the curing process on these projects as well as all others being laid in this state. We have definitely learned that some curing practices which have grown up over the past 10 years are not conducive to the best results, particularly with concrete pavements.

We are certain that one method which gives good results is the 24-hr initial moist burlap, followed by a long period of wet earth curing. The length of this wet earth curing period depends upon the circumstances involved. Where we use the coarse ground cements, 20 days is considered necessary.

The manner in which the initial 24-hr burlap curing is handled is also a very important factor. We feel certain that the burlap should neither be excessively wet nor completely dry when curing under summer temperatures. The purpose should be to achieve a dampness in the burlap that will at every second moment not let be so wet as to add more water to the surface than it needs during this critical period. Very careful attention must be given to the curing while the dry condition tests out for checking.

An entrainment is incorporated on jobs of each of the sections using modern fine ground cement and the modified coarse ground cement. Since so much attention has been given to air-entrained concrete recently, it has been included for a study along with the change in cement types. The air entraining agent is added at the mixer to entrain an amount of air generally recognized as adequate.

• **Long-range tests** A long-range program has been set up to test the soundness of the concrete pavement on the three projects now under construction, using a sonoscope. This equipment, which measures the rate of sound travel through concrete, was developed in Canada by Cheesman and Leslie of the Hydro-Electric Power Commission of Ontario.

Other features of design and materials, many of which were adopted in 1946, are similar to those used by other highway departments. Coarse aggregates are limited to 1 in. maximum. Granular subbase of 4 in. compacted thickness is required beneath pavement over subgrade susceptible to pumping, or where annual rainfall exceeds 25 in. Wire reinforcing mesh, weighing 44 lb per 100 sq ft, is used for crack control. The entire program is aimed at increasing the service life of concrete pavements, within economical limits.

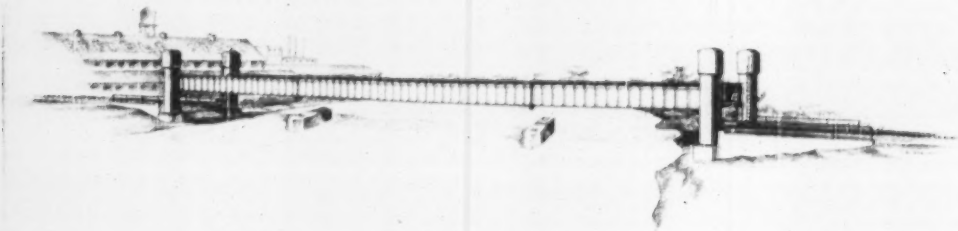
In the past, concrete pavements have been a necessary surface type. Since traffic volume and traffic weights are increasing, we will have even greater need for concrete pavements than we have had in the past. We are trying to achieve at least a 20-yr life span for the pavement without major maintenance cost.

• **Costs no more** Bids opened on these projects revealed that they can be built without any increase in cost over what we had been paying in the recent past. A recent report by the Bureau of Public Roads has revealed that the initial cost of concrete pavements in Kansas are among the lowest in the nation. It is not our intent to increase these costs but to achieve the service life within a reasonable investment that will provide the people of Kansas with the most for their money.

The study on the Topeka test road is continuing. We know that many other highway departments are interested in this work as well as BPR, the Portland Cement Association and the cooperating cement companies.

The Kansas Highway Department points out the cooperation shown by the cement companies who are participating in this program. They have invaded at every opportunity to work in their mills and their laboratories and to examine their product. They say we conclude that if successful this work may become more typical of better concrete pavements in the future.

A three-span continuous girder normally, the bridge becomes . . .



. . . A simple span of 232 ft when hoisted up to let floods pass.

Bridge Vaults Over Floods

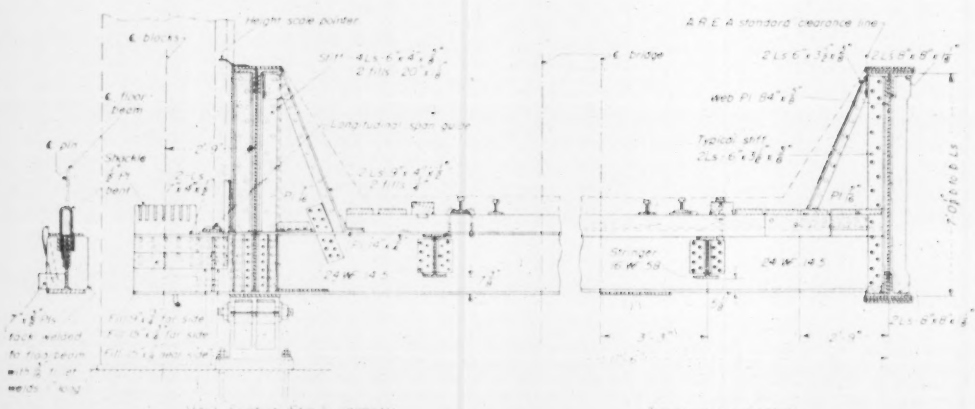
Josef Sorkin

Howard, Needles, Tammen & Bergendoff
Kansas City, Mo.

When the Blue River floods at Kansas City, Mo., a 232-ft long, three-span bridge over the river will be lifted off its four supports to clear the raging waters.

Now under construction, the structure is a continuous, through girder, single-track railroad bridge, designed for Cooper E60 loading. Grade is controlled by the floor level of nearby Sheffield Steel Corp. buildings, which are served by the railroad, and by service tracks elsewhere. General layout and the length of spans were dictated by an existing bridge close to the site.

• The Blue River ordinarily a stream of moderate flow is subject to occasional flash floods. An extreme stage rises as much as 26 ft above normal low water. Heretofore, since the required normal grade of the bridge was within 1 ft of maximum high-water level, and since the Army permit stipulated that low steel must clear the flood waters by 3 ft, provision for lift-



DETAILS OF THREE-SPAN CONTINUOUS GIRDER BRIDGE that spans 232 ft as a simple beam when lifted

ing the spans was deemed necessary.

In early studies of the project, the designers planned to use three simple girder spans and considered usual lifting devices, such as hydraulic jacks and screw jacks. They concluded, however, that while such an arrangement would be quite practical, operation of the jacks within the limited space on the abutments and piers, and the entire procedure in lifting the three spans, would be cumbersome and would entail complications in providing stable supports for the spans in raised position. The studies finally led to the adoption of continuous-girder construction, with the lifting mechanism set on the abutments.

• **Girders lifted at ends**—In normal position, the 232-ft bridge consists of a 104-ft center span flanked by 64-ft end spans. It rests on concrete piers and abutments carried on steel piles driven into shale. In its raised position, the structure functions as a simple beam spanning 232 ft.

Considering the infrequency of flood stages requiring raising of the span, the designers permitted the allowable unit stresses in the girders to be exceeded 33⅓% when the span is up. On this basis, the amount of additional steel needed to satisfy this condition is quite nominal. Actually, the amount of steel in the girders is about the same as would have been required for the three simple spans as originally contemplated.

To provide the necessary clearance above floods and allowing for deflection of the girders on a 232-ft simple span, which in itself will amount to more than 13 in.), the lifting machinery will raise the bridge 7 ft. In the initial studies, the designers considered power-operated screw jacks for lifting. They discarded the scheme, however, primarily because of adverse effects of thermal expansion or contraction of the girders, which might bend and bind the screws. They finally adopted a pulley arrangement, which would not be impaired by the longitudinal movement of the suspended girders.

• **Hoisting equipment**—As finally developed, the machinery consists of 4 hoisting assemblies, one at each corner of the bridge. With past experience indicating that ample notice will be given in advance of an oncoming flood stage, the machinery is designed to lift the span in a period of 30 min—equivalent to a speed of about 3 in. per min. For this slow operation, the designers did not deem it necessary to synchronize the hoists. Any variation in the movement of each corner of the span can be controlled by intermittent stopping of the leading hoist.

Due to extreme infrequency of operation and consequent negligible power costs, the lifting machinery is designed to raise the span, which weighs about 320 tons, without the benefit of counterweights. Enclosed in steel housing, each hoist assembly consists of a 5-hp motor operating a 12-in. dia drum through a series of worm-gear reducers. Winding a 2-in. wire rope on this drum lifts the span. The rope is continuous over 2 sets of 4-sheave blocks and an equalizer to form an 18-part system. Hoisting ropes engage the end floorbeams, which extend transversely beyond the main girders for this purpose.

The position of the span longitudinally when moving is controlled by grooves in each tower in which the ends of the floor beams ride. Transversely, movement is controlled by bumper attachments at the ends of the main girders and by guides connected to the towers.

Robert F. Kuhnlein, construction superintendent of Sheffield Steel Corp., is in charge of the project. The bridge was designed and its construction is being supervised by Howard, Needles, Tammen & Bergendoff, consulting engineers, Kansas City, Mo. Massman Construction Co. of Kansas City, Mo., is the contractor for the substructure and Kansas City Bridge Co. for the superstructure.

Why Fly Ash Is Used For Hungry Horse Dam Concrete

By substituting fly ash for about 30 percent of the total cement requirement in the concrete being placed in Hungry Horse Dam in Montana, a saving of over $4½ million is being effected. Writing in the May Journal of the American Concrete Institute, Robert F. Blanks, chief, research and geology division, U. S. Bureau of Reclamation, tells why this saving can safely be made, in fact with improvement in the concrete.

Laboratory investigations have demonstrated that most fly ashes (as recovered from the stacks of powdered coal burning furnaces) are of considerable value when used in concrete because the silica glass of which they are largely composed will, in the presence of water, react with free lime, liberated during hydration of portland cement, to form a more stable cementing medium.

The amount of mixing water required to produce a concrete mix having a given degree of workability is slightly less for a combination of fly ash and cement than for straight portland cement. Most other pozzolans increase the water requirements of concrete mixes. Like most other fine pozzolanic materials, fly ash makes concrete mixes more plastic and decreases segregation and bleeding.

Strengths are lower at 7 to 28 days, but at one year the strength for concrete containing fly ash approximately equals the strength of concrete made from portland cement alone.

Excellent resistance to freezing and thawing, even at early ages, is developed by Hungry Horse concrete containing 30 percent fly ash, with entrained air and a reasonably low water-to-cement-plus-pozzolan ratio. It also shows a superior resistance to the attack of sodium sulphate than does corresponding portland cement concrete.

Although test results are incomplete, it is indicated that fly ash concrete is less permeable than straight portland cement concrete.

The combination of fly ash and portland cement produces a lower heat of hydration and a consequent lower temperature rise than an equal amount of portland cement without fly ash. From the Hungry Horse mixes it has been determined that, when combined with portland cement, fly ash will produce about 40 to 50 percent as much heat as an equal weight of modified portland cement.

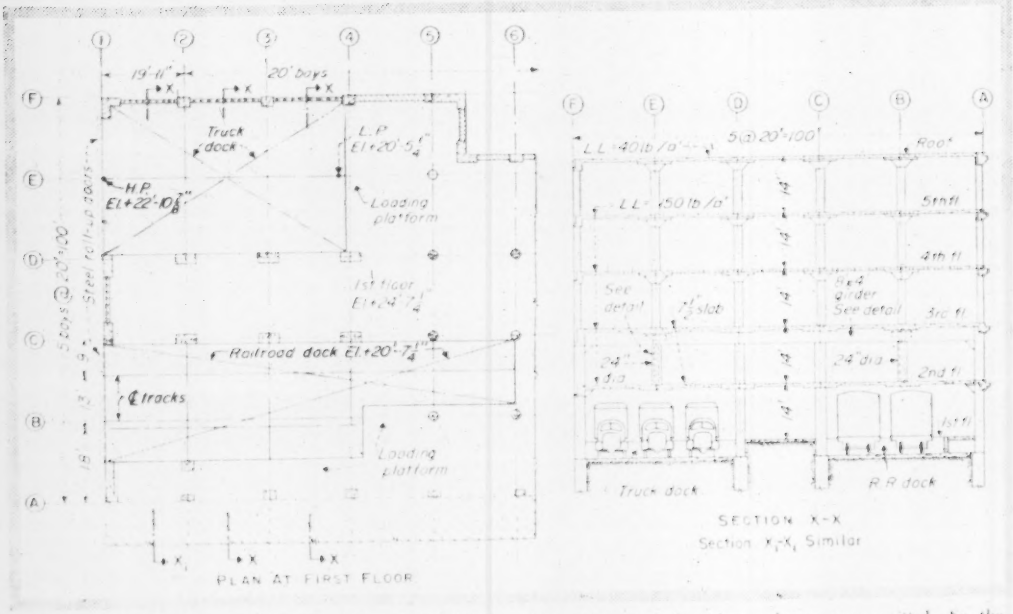
Drying shrinkage is generally less for fly ash concrete than for straight portland cement concrete or for concrete containing most natural pozzolans.

About 80 percent of the cost of the fly ash used at Hungry Horse Dam is for shipping charges. In spite of this expense fly ash is delivered at approximately one-half the cost of portland cement, which accounts for the total overall cost savings that is being achieved.

HUNGRY HORSE CONCRETE MIX

	Interior concrete	Exterior face concrete
Portland cement, lb per cu yd	188 (sack)	282 (75-sack)
Fly ash, lb per cu yd	80	120
Aggregate,* lb per cu yd	3,572	3,487
Water, lb per cu yd	129	146
W/C + P ratio, by wt	0.46	0.39
Sand, percent	28	22.5
Entrained air, percent	3.5	5.5
Slump, in.	2½	3½
Compressive strength at 1 year, psi, 18 x 36-in. sealed cylinders	4900	4300
6- x 12-in. standard fog cure	5000	4600

*Nom. maximum size



FLAT SLAB BUILDING for Life Savers, Inc., lacked headroom for girders at docks, where columns were omitted. So the second floor slab was hung from girders that were inserted at the third floor level.

Slab Solves Headroom Problem

Stephen E. Muchenmore
Associate, Lockwood Greene Engineers,
New York, N. Y.

DESIGNERS of the 5-story, 110,000-sq ft addition to the Life Savers, Inc., candy factor at Port Chester, N. Y., have come up with a convenient solution to a tough problem.

The building is of reinforced concrete flat-slab construction. Space required for truck and railroad loading docks made elimination of six ground-floor columns mandatory, and there was insufficient headroom for girders to carry the second floor. The solution was to hang the floor from a girder at the third floor.

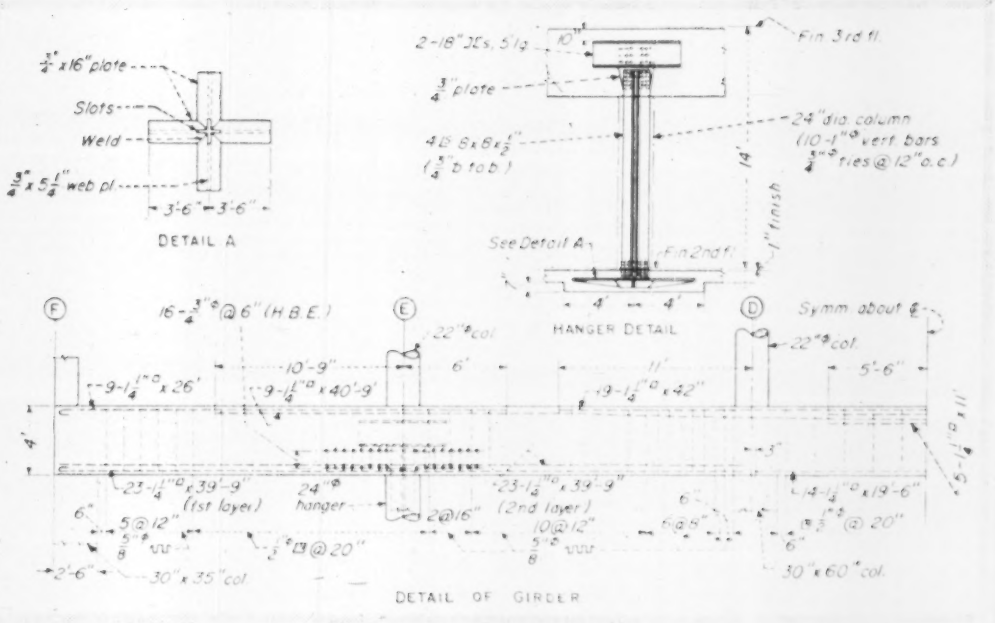
Headroom in the new building was fixed by the floor levels in the existing structure. Corresponding floors were required to be at the same elevation. Section X-X shows the result. Vertical clearance under the second floor at the railroad siding and truck docks left only 15 in. for second floor construction. At each of the six locations a girder

• **Rigid frame design**—Here, too, the designers had to compromise. Girders at the third floor are common to bays 3 and 4 see plan. Each girder supports the three tiers of columns above those eliminated and hangers carrying the second floor.

were carefully set on the second floor forms and concreted with the second-floor slab. Plywood girder forms were erected around the hangers, and shoring for the girders was built up from the ground on first floor. Then, starting at one end of a girder and continuing across the building to the other end, the contractor placed the concrete in three nearly equal layers, the third, including a 20-in width of slab. Concreting proceeded swiftly enough that no set occurred between placing of layers.

Concrete was mixed in transit and delivered to the forms in 6-cu ft buggies. It was vibrated with gasoline engine-driven vibrators to eliminate honeycombing.

• **Admixture increased strength**—The designers felt that it was important in the construction of this building that concrete of high density and strength with minimum shrinkage be secured. They also wanted a high degree of durability for exposed portions. To obtain these results, they specified a cement-dispersing, water-reducing agent and employed a recognized testing laboratory to design the concrete mixes in collaboration with the manufacturer.



CONTINUOUS GIRDERS at the third floor support three tiers of columns and hangers carrying the second floor. The girders are only 4 ft deep, but 8 ft wide. The welded "spider" at the bottom of the hangers is used to reduce shear on the slab.

Concrete Prestressed by Alloy Bars

• **New jack developed.** Mr. Lee developed a hydraulic jack for stressing the

Technical advances push . . .

Ion Exchange for Water Treatment

DEVELOPMENT of resinous cation and anion exchangers open up an entirely new field of use and efficiency and call for a complete re-evaluation of water treatment processes.

This is the gist of a review of the present status of ion exchange by W. W. Aultman, water purification engineer, Metropolitan Water District of Southern California, La Verne. He spoke before the American Society of Civil Engineers at the spring meeting in Los Angeles.

• Spheres of influence. Resinous cation and anion exchangers, he said, may influence water treatment in four ways. These are:

1. Because of high salt efficiency, polystyrene resins operating on the sodium cycle warrant serious consideration in studies to select the best softening method for a specific water.

2. Quality of raw water has little or no effect on some resinous exchangers—a factor of considerable value in water conditioning for boilers and process industries.

3. Silica may be removed from water with comparative facility and at reasonable cost.

4. Waters of almost any desired quality may be produced for municipal and industrial use, the economic feasibility depending on raw water condition.

• For water softening. Polystyrene resins, Aultman points out, possess three characteristics of critical importance to the selection of an exchanger for water softening:

1. Their high capacity permits smaller volumetric installations. This gives a lower equipment cost for a softening capacity equal to any of the other exchangers.

2. If raw water is clean, its quality in other respects has almost without exception no harmful effect on polystyrene exchangers. They are not affected within a pH 1 to 14 pH range or temperatures more than 200 deg F. And chemical "poisoning" of water does not tend to build down in the exchanger. This, he says, is not true of synthetic siliceous zeolites that should be used in a pH 6 to 8.5 pH range, at temperatures not exceeding 140 deg F, and that are dissolved slowly by waters low in silica.

WHAT IS ION EXCHANGE?

Ion exchange is defined as a reversible interchange of ions between a liquid phase and a solid body with no radical change in the solid structure.

An ion exchanger, or solid body, must have ions of its own to exchange for others, and a highly porous structure or large exposed surface to allow these ions to move in and out.

3. Operating efficiency of polystyrene resins is appreciably higher than any other type of exchanger in commercial use.

Operating efficiency and economy, Aultman states, are pointed up by the Metropolitan Water District's experience. "For synthetic siliceous zeolites, an average exchange capacity of 5,700 grains per cu ft is obtained at a salt requirement of 0.37 lb per kilograin of hardness removed. But polystyrene resins have a capacity of 22,000 gr per cu ft when regenerated at the rate of 0.24 lb of salt per kilograin of hardness removed. (Table II.) Summed up, the latter has 2.5 times the exchange capacity of the former with two-thirds of the unit salt consumption.

• Costs. Translated into dollars and cents, this means that Colorado River water (with an average hardness in 1948 of 334 ppm or 19.5 gr per gal) can be softened to zero hardness at

LET'S USE CORRECT TERMINOLOGY

Because cation exchange phenomena have been long identified with zeolites, the term "zeolites" is widely employed to include all ion exchange materials. Today, cation exchange softening of water is generally referred to as "zeolite softening." This is not strictly correct. With the advent of organic exchangers, an effort is being made to identify such softening reaction as cation exchange softening.

When cation exchangers are being used, such identification is also necessary.

the District's plant utilizing polystyrene resin exchangers at a cost saving of about $5.65 per mg. To do this job with zeolite required 7,215 lb of salt and with a polystyrene resin 4,050 lb. And salt costs $4.46 a ton delivered.

"If salt costs $9.00 a ton or more, as it does in most places in the U. S., the saving would exceed $11.41 per mg, he points out. This is a saving in salt alone. It does not include economies in rinse water or less equipment cost."

A polystyrene resinous exchanger, on the other hand, costs about 2.5 times that of a zeolite unit. But useful life of the former is twice that of the latter, Aultman continues. "Under identical operating conditions using Colorado River water, life of zeolite averages about 2 mg per cu ft of exchanger while that of polystyrene resin is more than 4.0 mg. Considering all factors, appreciable savings accrue from application of the polystyrene rather than the zeolite exchanger, he says.

• Ocean-water regenerant. Treatment costs may be reduced by utilizing polystyrene resin with ocean water as the regenerant for cities on the seacoast. Regeneration of zeolite exchangers with sea water is not new, Aultman recalls. But "it is the first time that relatively high-capacity exchange has been available and is obtained with a small amount of sea water circulation."

A municipal softening plant, he reports, is under construction at Ventura, Calif., that will make use of high capacity exchange and sea-water regeneration. The exchange capacity of the resin at various dosages of sea water for regeneration is given in the accompanying graph. It is evident that exchange capacities in excess of those obtained from any inorganic exchanger are obtained with this polystyrene resin under these conditions, Aultman concludes.

• Boiler-water treatment. Highly basic resinous anion exchangers—that will remove silica from water—are now available. This is an important step forward in boiler-water processing, he says, because such waters must be low in silica particularly if used in high-pressure units.

The true zeolites being siliceous materials, Aultman says, tend to add silica to water passed through them. Thus, carbonaceous exchangers have been utilized extensively for boiler-water treatment.

Resinous cation exchangers also withstand temperatures in excess of 200 deg. F. This property makes them suitable for processing hot water where heat conservation is practiced.

Resinous cation and anion exchangers harnessed together, he suggests, may also be put to work for part or complete demineralization of boiler water.

• **For process water** Very pure and uniform-quality water is required in many process industries. Distillation units have been widely utilized to get low-salinity water. But organic cation and anion exchangers can now produce a water equivalent in quality to distilled water generally at lower cost.

Demineralization is done in two steps. Process water is passed through an organic cation exchanger regenerated with dilute acid (hydrogenical cycle). Here all cations in the water—calcium, magnesium, sodium, potassium and dissolved iron and manganese—are absorbed, and hydrogen ions are released.

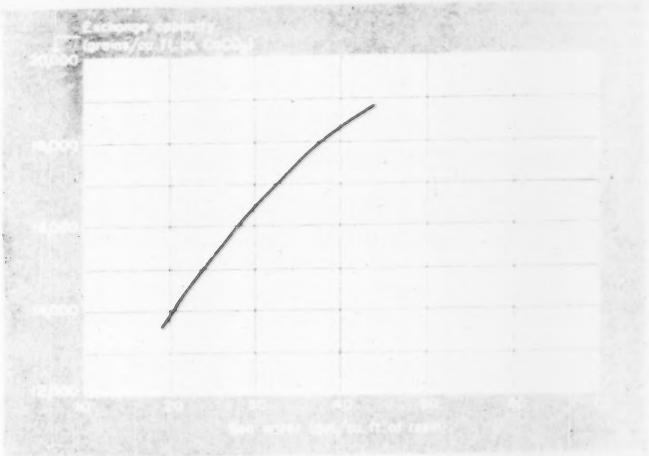
Cation-inactive water is then put through an anion exchanger. The negative ions—chlorides, sulfates and nitrates are absorbed in it. And carbonate of hydroxyl ions are released, depending upon whether soda ash or caustic soda is the regenerant.

The treated water consists essentially of water and carbon dioxide, Aultman says. Carbon dioxide may be removed by aeration, leaving a pure water.

Demineralized water—with a specific conductance of 10 to 20 million ohms per cm—is produced by recently developed resins operating in properly designed equipment, he reports. Resistance of a good distilled water is 0.5 to 1.0 million ohms. Chemical purity of water is proportional to its electrical resistance, one ppm of calcium carbonate salinity in water representing a specific resistance of about 400,000 ohms.

Cost of demineralization is proportional to raw water salinity but that of distillation is little affected by water quality. On the west coast at prevailing chemical prices, demineralization of water with 400 ppm total dissolved salines costs about $0.50 per 1,000 gal. Cost of distilling the same water is 5 to 10 or more times this amount, depending on type and size of equipment.

Aultman then calls attention to the fact that as salinity increases cost of



EFFECT OF SEA WATER REGENERATION on the operating exchange capacity of an ion exchanger charged with polystyrene resin.

TABLE I—CLASSES OF ION EXCHANGERS

I. Cation Exchangers
- A. Inorganic
  - 1. Natural zeolites (greensand)
  - 2. Processed greensands
  - 3. Synthetic zeolites
- B. Organic
  - 1. Natural (the lignites)
  - 2. Sulfonated coals (carbon-aceous zeolites)
  - 3. Synthetic resins
    - a. Phenolic base
    - b. Polystyrene

II. Anion Exchangers
- A. Inorganic
  - 1. Metallic Oxides
- B. Organic
  - 1. Synthetic Resins

Regeneration Methods

Cation exchangers, in general, may be regenerated with common salt (sodium chloride) and be used to remove hardness-forming calcium and magnesium from solutions.

Organic cation exchangers may also be regenerated with dilute acid solutions. In the resulting hydrogen condition, they will remove all metallic cations—sodium, potassium, iron, copper, manganese, etc.—from solution.

Anion exchangers, used to remove acid ions—sulfates, chlorides and nitrates—from solution, may be regenerated with either soda ash (sodium carbonate), caustic soda or ammonia.

While both inorganic and organic anion exchangers have been manufactured, only the organics are widely used at present. The inorganic materials do not have good operating characteristics for demineralization.

TABLE II—RELATIVE EXCHANGE CAPACITY OF CATION EXCHANGERS

	Cation Exchanger Capacity (Grains per cu ft)	Nominal Exchange (lb per cu ft)	Salt Dosage (lb for kilograin of hardness removed[2])
Greensand	2,800	2.4	0.45
Processed greensand	5,500	2.47	0.45
Synthetic siliceous zeolite	11,000	4.95	0.45
Carbonaceous	7,000	2.15	0.4
Resin, phenolic	15,000	6.75	0.45
Resin, polystyrene	28,000	12.60	0.45
Resin, polystyrene	20,000	5.00	0.25

demineralization by resinous cation and anion exchangers increases proportionately until a point is reached where distillation is cheaper. "It is evident that a water of almost any quality may be produced by resinous cation exchangers operating on either the sodium or hydrogen cycle coupled with resinous anion exchangers. This gives the sanitary or chemical engineer, Aultman states, an excellent tool for solving intricate water-quality problems for process industries."

• **Taking salt out of water.** A new method—with a cheaper cost of operation—has been developed in Palestine for partial demineralization of brackish waters. This large-scale treatment process takes water with 1,000-2,500 ppm total dissolved salines and turns out an effluent with 300 to 500 ppm. "Ion Exchange Process for Brackish Waters, Chem. Eng. News 27:45, Nov. 1949.) This process, still under investigation, appears capable of producing water for domestic use at practical costs if raw water contains no more than 2,500 ppm total dissolved salines.

Seawater demineralization on the other hand, Aultman warns, presents a more difficult problem. This water contains 32,000 to 36,000 ppm total salines. And the cost of chemicals alone for demineralization by known methods would be about $25.00 per 1,000 gal.

Although vapor-compression distillation of sea water is much cheaper than demineralization, he says, it would still cost more than $1.25 per 1,000 gal with present equipment.

"Perhaps more efficient means of producing potable from sea water may evolve," he suggests, if Congress authorizes the $500,000 requested for research on this problem. But, he emphasizes that "present scientific knowledge does not indicate that cost of such reclaimed water can ever approach that of locally developed water supplies in the U. S."

• **Look to the future.** "Development of resinous ion exchangers is in its infancy. All engineers in any way concerned with water treatment should keep abreast of progress made in perfecting operating techniques and procedures when using these materials," Aultman recommends.

Notes on Legal Decisions

Summaries of decisions relating to construction prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill)

Compensation of Architects

A reader of ENGINEERING NEWS-RECORD, after a review of the item headed "No Pay for the Architect" in this column of the May 18 issue (p 42), suggested that question-and-answer discussion should be given to indicate that the case there cited is an exceptional one rather than the general rule. Actually, the case cited in the May 18 issue did conform to the general rule.

The important consideration in all such cases is what did the architect CONTRACT to do? In the case as reported May 18, the architect contracted to prepare plans for a hotel that would not cost over $250,000. After he had prepared the plans, contractors' estimates showed that the cost would be more than twice the upper limit set by the owner. Hence the architect had failed to perform his part of the contract and so could not recover for his services.

The general rule was clearly stated in an earlier case, Pierce vs Board of Education, in which the court said: "It seems to be well settled that where plans are required for a building not to cost more than a certain sum, or are accepted on condition that it can be erected for a given amount, the architect is not entitled to recover by the architect unless the building can be erected for the sum named, or unless the increased cost is due to special circumstances or to a change of plans by direction of the owner."

"But where an architect, between agreeing to prepare plans for a structure, the cost of which is not to exceed an agreed price, and preparing plans and specifications according to the expressed wishes of the owner and their giving an estimate of the approximate cost of the erection of the structure. In the latter case, mere non-conformity in the cost of construction under the plans and specifications does not prevent the architect from recovering for his services."

A contract by an architect for preparing plans for a building that should not cost more than $15,000, approximately, is satisfied by a construction cost of $16,000. The cost of the structure must approximate the stipulated upset cost.

Architects in order to protect their rights to compensation for preparing plans and specifications, should make it clear to owners that when they give an estimate of cost that it is only by way of an approximate estimate and that it is no stipulation that the cost will not exceed such estimated cost.

It is possible that under the principle of law set forth in Pierce vs Board of Education, that even in cases where there is an upset figure of the cost of the proposed structure, the architect will not be deprived of compensation for the services rendered when the excess cost is due to special circumstances, such as encountering unforeseen conditions during the course of construction or increased cost of labor or materials while the plans are being prepared or during the course of construction.

Computation of Damages

Where it is shown that a contract has been breached, it is not necessary to prove to an absolute certainty the amount of damages, this being a matter for reasonable determination according to the circumstances of each case. The underlying principle is full compensation for the wrong done, and the general rule is that the compensation shall be equal to the injury.

The breach is the standard by which the compensation is to be measured, and all that the law requires is that such damages be allowed as, in the judgment of fair men, directly and naturally resulted from the breach of the contract for which the suit was brought. It is sufficient if a reasonable basis of computation is afforded, although the result may only be approximate.

A party whose wrongful conduct has rendered difficult the ascertainment of the precise damages suffered by the other party, is not entitled to complain that the damages cannot be measured with the same exactness and precision as would otherwise have been possible.

Failure to Procure Bond

A subcontractor is entitled to recover the damages sustained by him by reason of misrepresentation of owner that it had procured and held a bond in accordance with the contract between it and the general contractor for the payment by the general contractor of all its obligations to the owner and all subcontractors, upon which representations the subcontractor relied and furnished labor and materials.

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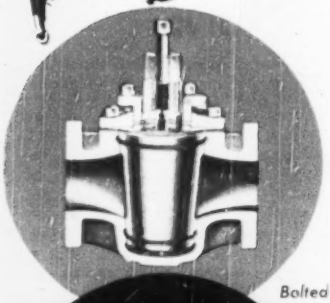
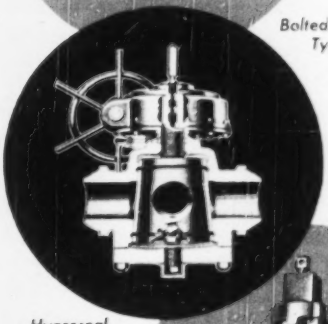
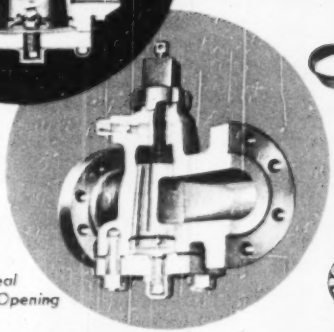


Bolted Gland Type



Hypreseal Round Opening



Hypreseal Rectangular Opening

Nordstrom Valves

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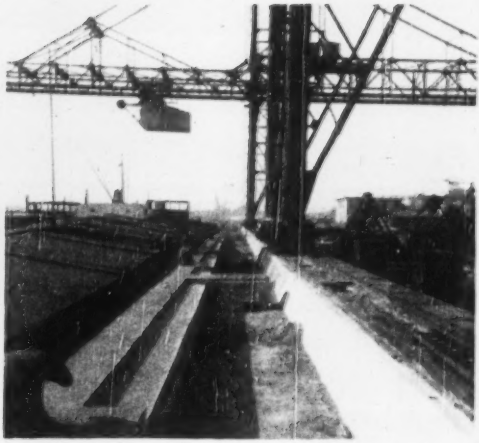

Dutchmen have rebuilt a port as . . . .

Rotterdam Goes Back to Work

J. G. Buitink
Chief Executive Engineer
N. V. Havenbedrijf, Rotterdam

As rebuilding in the Netherlands is complicated by lack of equipment, time bombs, and actual destitution of the laborers employed, Dutch engineers have been able to restore the great port of Rotterdam to full service.

Briefly, the problem facing the engineers when Rotterdam was finally liberated in 1945 was this:

The city and its vast port works was nearly destroyed by German attack before the occupation of the Netherlands. The Dutch government immediately organized a group, called "Dieverio," to attempt reconstruction. Even under the handicaps of German occupation, this organization cleared seven million cubic yards of debris and pulled out 8 million ft. of wooden piles.

But in the autumn of 1944 the advancing Allies, now under invasion attack, the Germans destroyed more than 24,000 ft. of Rotterdam's quaywalls in an attempt to block allied use of the port facilities.

The last demolition was done by heavy bombs which not only destroyed the quays, but dumped cranes, loading bridges, warehouses, sheds, into the harbor with heavy damage. The great chunks of wall, twisted frames of 150-ton cranes and thousands of tons of other debris were in many places totally covered by sand which spilled out from behind the quays.

• **Which comes first?** No engineer faced almost the old "chicken and egg" problem: To dredge out the sand, the debris had to be cleared away, but to clear the debris, the sand had to be taken out first.

Theoretically, the problem could have been solved by using floating cranes with a capacity of 50 tons, and clamshell buckets that could hold 20-ton pieces. But only a few 15-ton cranes and some home-made heavy derrick cranes were available.

The government finally invited five big Dutch construction firms and three English firms to form a combination, known as "N. V. Havenbedrijf," to do the cleaning and reconstruction. Using make-shift equipment and labor that was ill-fed, ill-clothed and almost without tools, this group was never able to clear 75,000 tons of debris, and 27,000 tons of sand in 20 months.

Complicating the work was the fact that among the debris—20 to 50 ft. below water level—were 25 unexploded bombs. By great good luck, the bombs were removed without a single explosion. By April, 1946, the clearing job was well under way and reconstruction of the quaywalls, most of them designed for a water depth of 33 ft., could be pushed.

By scrounging some equipment from U.S. war-dumps in Belgium, and importing barges, the contractors were able to repair their own machinery, build a big supply yard, repair shops and storehouses.

The original quaywalls had been built on piles or caissons, by differing methods, over a period of many years. For reconstruction, one part of the harbor was completely dammed off with a sand dike, and pumped dry. In another part of the harbor, caissons were repaired behind a curtain of steel sheetpiles. In some places the caissons were damaged beyond repair, and one new quay was made by driving a heavy sheet steel wall in front of the old quay. In other places reinforced concrete sheet piling was used, with tie piles behind the old quay. The quays, which had been built originally on piles, were repaired by using sheetpile curtains, although a few of them were rebuilt by using an old diving bell.

In the course of this work, 35 caissons had to be built, with an average length of 500 ft. each. Eleven of these caissons were built at the same time, for example, complicating the problem of scheduling the many differing operations being carried on.

In all, 12,000 concrete piles were driven, more than 120,000 tons of sheet steelpiling was used and reused, 500,000 sq. yd. of forms for concreting had to be made, and 220,000 cu. yd. of concrete were poured.

Most of the work could be done from the water, and a fleet of over 100 ships of different types were used to transport 2,500 tons of material that had to be handled to clear the harbor and rebuild the quays.

The job was finally completed in December of 1949.

READER COMMENT

Added Information

Sir: An addition should be made to my article on open channel flow (ENR Feb. 16, 1950, p. 40). The text was condensed and did not show that there is no solution where the R/A ratio exceeds the tabular value, and also that there may be two solutions.

R. D. GRADING
Companhia Vale Do Rio Doce
Rio de Janeiro, Brazil

Compensation for Architects

Sir: Reference is made to the summary of a legal decision headed "No Pay for the Architect" on p. 42 of your May 18 issue.

Owners frequently have a way of building up costs on a project after the original deal, which the architect will follow in his effort to satisfy his client. When the bids come in, the owner still pretends that the refinements and additions should all be included within the original budget, although he was probably advised to the contrary several times during the planning process. The architect becomes the "bum" who was trying to spend the owner's money.

The decision recorded in your article will encourage owners to run an architect or engineer in circles to pump the bill, at the owner's secret personal interest in construction should change during the planning process.

It may be well to discourage owners and unscrupulous attorneys from stamping the architect's bill to publishing a few decisions from other courts on similar cases, where the architect won his fee. The attorney does not guarantee results but he gets paid.

JOSEPH G. CONRATH
Consulting Engineer
Erie, Pa.

Flood Storage at Grand Coulee

Sir: A news item (ENR May 11, 1950, p. 28) indicates that the federal government is finally going to do something about Grand Coulee Dam. The way that dam and reservoir were operated during the flood of 1948 is a disgrace to the profession, besides representing undoubtedly action on the part of the government. For example:

The reservoir (Roosevelt Lake) was absolutely full by May 5, when there was only 175,100 cfs flowing. Not another acre-foot of water could be stored after that date, even though the crest of the flood at Grand Coulee was not reached until June 12, with 637,000 cfs flowing. The second crest at Vancouver, which was equal to the first, occurred June 14. It is obvious that floods were aggravated by the operation of Grand Coulee Dam at the entire reach of the river below that dam. Not even the natural channel storage capacity in the 150 miles of river now occupied by Roosevelt Lake was available for retaining the outflow from that reach of river and reducing flood crests below. The data are from U. S. Geological Survey's Water Supply Paper 1030.

If that dam had been operated by a private corporation, that corporation would now be defendant in a flock of lawsuits, and rightly so.

If the departments of government will not voluntarily use better judgment, then perhaps Congress had better stipulate in every authorization for a dam to be built on a stream or a like subject to floods, that the structure shall never be operated to aggravate floods and that, in every reservoir, storage should be reserved for flood control, at least the equivalent of the natural valley storage which is being eliminated. Whenever a dam releases floodwater as fast as it comes into the reservoir, *while the stream is still rising above the reservoir*, it is aggravating flood conditions on the stream below and the owner is taking property without compensation.

ADOLPH F. MEYER
Consulting Hydraulic Engineer
Minneapolis, Minn.

Weight and Speed

Sir: We notice in the April 27th issue of ENGINEERING NEWS-RECORD on page 17 under the title "Quotation from Week," an item under the heading "On The Double." This refers to the Port of New York Authority's new Bus Terminal and states that the loaded baggage is always moving, or appears to be, and often "On The Double."

Perhaps the employees in the colonial shop were looking down at the times when they were pouring Waylite lightweight aggregate and this no doubt contributed largely to the speed with which the workmen can handle those baggers.

We are proud of the way that Waylite has performed in that building.

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Contractors and Operators throughout the Country Proclaim the New TD-24 CHAMPION of Crawlers

The International TD-24 has proved itself CHAMPION of Crawlers. On job after job, the new TD-24 has won the admiration of operators for the ease with which it does work which other tractors cannot do. Contractor-owners are equally enthusiastic, for they see the TD-24 outworking and out-producing every other tractor in the field.

Greater power, and the weight and traction to match, plus new operator convenience and ease of control, give the TD-24 much more than an edge over any other tractor you might name.

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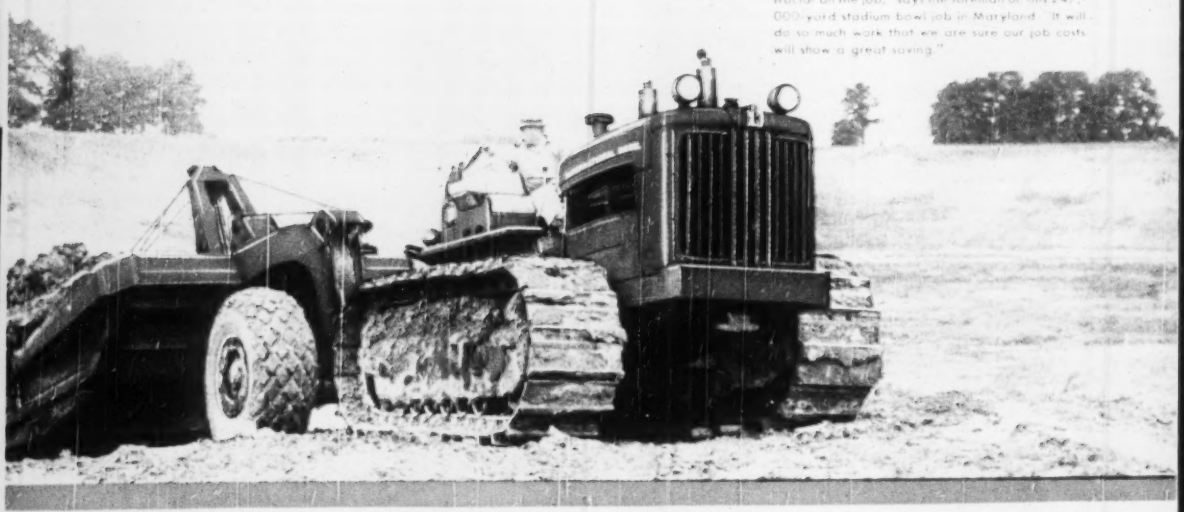
"The TD-24 is a wonderful piece of machinery and I can't say enough for it. Our operators feel they are wasting their time when they run other tractors, for no other tractor built can compare with the work these TD-24's can do."

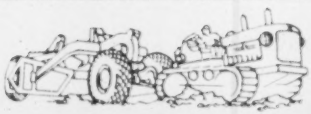
Visit your International Industrial Power Distributor and see what the TD-24 can do for you. You'll agree it's the CHAMPION of Crawlers—the one tractor you can't afford to be without, for profitable earthmoving.

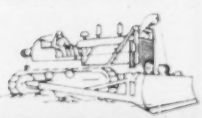
INTERNATIONAL HARVESTER COMPANY
Chicago

JOB FOREMAN REPORTS SAVINGS

"If the TD-24 is definitely outhauling every other tractor on the job," says the foreman on this 247,000-yard stadium bowl job in Maryland. "It will do so much work that we are sure our job costs will show a great saving."







Crawlers

"Worth Two of Any Other Heavy Tractor," says Lindsey Belville, president of Greasy Ridge Coal Co., Greasy Ridge, Ohio, strip mine. "This is the best tractor I've ever used in my five years experience," says Warren Bare, the tractor operator shown working it in heavy rock. "It is the only one that will do everything I want it to," he claims.

INTERNATIONAL HARVESTER

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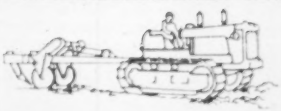

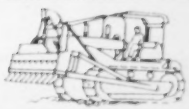

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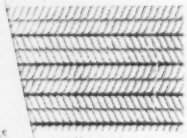
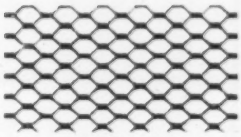
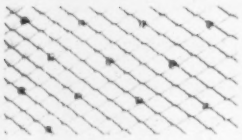


Herringbone Doublemesh Lath

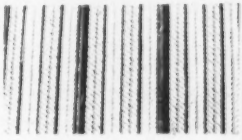


Diamond Lath

Self-Centering Lath



Stucco Mesh



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DEVELOPMENTS ABROAD

American Embassy in Rio

A new American Embassy building will soon start rising as an imposing addition to the skyline of Rio de Janeiro. It will be the outstanding embassy there and one of the State Department's most costly construction projects overseas.

The new building, on the same site as the former small embassy now demolished, will be a stone-faced structure of 12 stories and basement. There will be a broad expanse of windows set in stainless steel frames. Besides space for informational and cultural activities on the lower floors, there will be seven floors of offices and three floors of residential apartments. The basement will provide parking space for official vehicles.

The building will be on a large plot which faces Rio harbor across "United States Square" on which stands a statue dedicated to Brazilian-U. S. friendship.[1] The building will be acoustically treated, and air conditioned throughout by a central system.

Plans for the Embassy were announced in Rio by Comdr. Peter A. Collins Corte, regional supervisor of U. S. foreign buildings for South America. Design was by the architectural section of the State Department's Foreign Buildings Operations under the direction of Frederick Larkin and Leland W. King, in collaboration with the New York architectural firm of Harrison & Abramowitz. The latter firm was associated in the design of Radio City and the new U. N. buildings.

Constructors will be headed by four Brazilian contractors: Graca Coute & Cia. Ltda. as general contractors; Empresa Brasileira de Engenharia, S. A., plumbing and electrical work; Elevadores Otis S. A., elevators, and General Electric S. A., air conditioning.

Italian cement industry

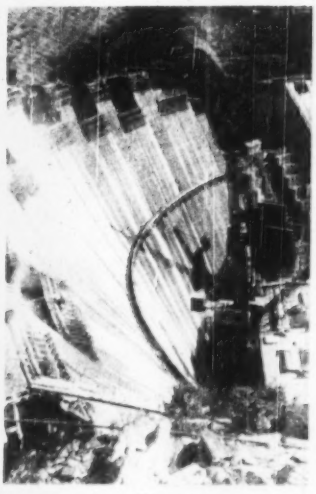
Although in the second half of the year the Italian cement industry was badly affected by the shortage of electric power, the output in 1949 was 25% higher than in 1948 and exceeded 36 million bbl. This represents 66 percent of the country's mill...

The market shrinkage of prices which occurred in 1949 was accompanied by heavier exports which rose to 500,000 bbl as against 280,000 in 1948. Practically no cement was imported.

Aid for Korea. Robert E. Heidman of Heidman, Monti, construction engineers for the proposed dam and power plant on the Big Horn River southwest of Hinlin since 1947, has gone to Korea to head a group of engineers who will make basic studies and surveys of three hydroelectric projects and one hydroelectric and irrigation project in that county at the request of the Korean government to the Economic Cooperation Administration. Heidman will be accompanied by six other Bureau of Reclamation engineers. The Economic Cooperation Administration has established and Illinois Institute of Technology will operate a technological education institution in Korea known as the Korea Technical Institute. The institute staff will train Korean citizens as teachers, vocational instructors, technicians, plant supervisors, and shop foremen who later on can take their places in the educational and economic life of the Republic of Korea.

New dam nears completion in Portugal

By the end of the year the first power is expected to be produced from a unit forming a part of the general hydroelectric plan for Portugal that was begun soon after the war. The unit will be in the power plant fed from Castelo do Bode Dam now well along toward completion on the Zezere River about 75 miles north of Lisbon.



CASTELO DO BODE DAM nears its 378 ft height except at the spillway section at the right.

Castelo do Bode will be the first of four dams planned for the river by the Hidro-Electrica do Zezere Co., which holds the concession for this particular watershed. Situated as shown on the accompanying map, it will be the biggest power producer with 150,000 hp installed, but its height of 378 ft will be less than that of the uppermost dam, Cabril, which will rise to 411 ft. The other two dams will be considerably smaller.

The dams will regulate 55 miles of the river in which the total available head is 905 ft. The total installed hydro capacity will be 434,000 hp and the annual output 700 million kwh. Castelo do Bode will furnish 300 millions of this.

Castelo do Bode dam is of the thick-arch type. The spillway, designed for a maximum discharge of 150,000 cu ft per sec, is integral with the dam and near the left abutment. The flow over the spillway is regulated by two sector gates. The power plant situated directly below the dam will be equipped with three 62,000 hp turbo-generators, under a mean head of 263 ft.

The dam is being built between upstream and downstream cofferdams while the river is diverted by a huge tunnel in the right bank 40 x 32 ft in section, and designed for a maximum discharge of 72,000 cu ft per sec. The upstream cofferdam is a concrete arch 112 ft high, while the lower cofferdam consists of a rock embankment surmounted by a concrete overflow section.

First concrete for the main dam was placed from a low-level plant in August, 1948, and a high-level plant and a cableway system was also in operation 8 months later. Some 600,000 cu yd of concrete must be placed, and high rates have been achieved—monthly maximum about 40,000 cu yd and daily maximum of 2,100 cu yd, according to reports.

CENTRAL PORTUGAL will get its first hydro power from the Zezere River. Other projects are planned in the near future for the upper Tagus.

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Central African R R

One of the great African transport projects that will be placed before the coming conference of Central and South African countries will be a rail line connecting Northern Rhodesia with the entire East African territories.

This line, fathered by the British Colonial offices, will open up large fertile tracts that have remained untapped and untapped because of their remoteness. An important section of the line would be across the high Mbeya plateau between Lakes Nyasa and Tanganyika.

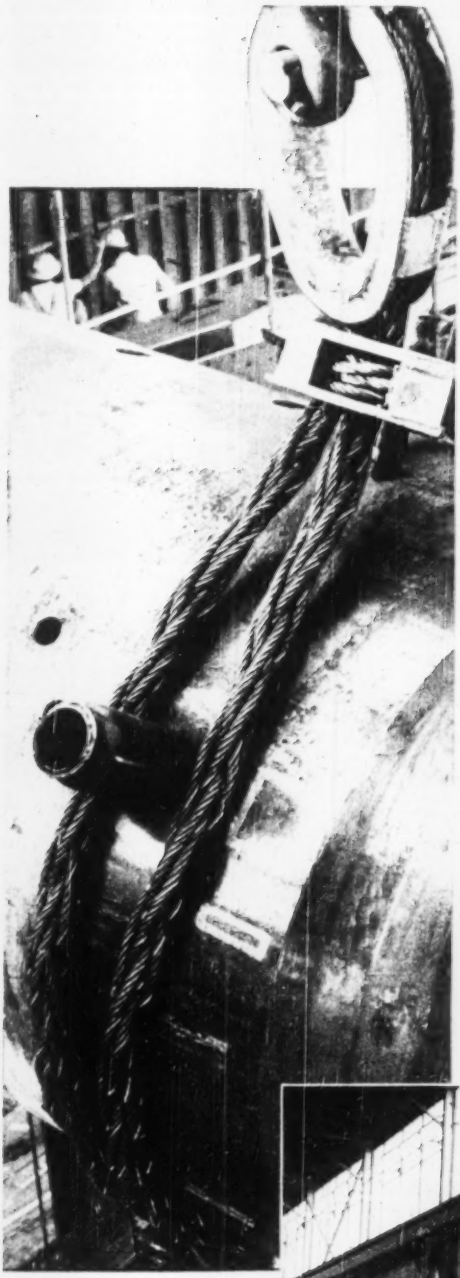
The October conference will attempt to bring about the coordination of all forms of transport in Southern and Central Africa, with the exception of airways.

Foreign Briefs

Ottawa redevelopment Work will start soon on a new switch yard for the Canadian National Railways at Hawthorne, close to Ottawa, Can. It is part of the overall plan for physical reconstruction of the Dominion's capital city. In addition to removing a cross-town rail line which snarls Ottawa traffic, the new yard will free for redevelopment the present mid-city freight yard. Cost of the new facilities, which, it has been estimated, will be between $3,000,000 to $5,000,000, will be paid from public funds by the Federal District Commission.

Costa Rica study A pilot study of how a Latin American republic can increase its own economic well-being and possibly qualify for United States assistance under the "Point Four" program is being undertaken in Costa Rica by the 20th Century Fund. Heading the survey team is Stacy May, chief economist of the International Basic Economy Corp. and former director of the Bureau of Planning and Statistics of the War Production Board. Other members of the study group are Albert R. Koch, Howard L. Parsons, J. Ezaland and Charlotte R. Carpenter.

Wave duty on prefabs In Canberra, Australia, it has been announced that duty on prefabricated houses and buildings imported from any country has been waived until the end of this year. Previously, the concession applied only to those imported from Britain. It applies to houses, huts, schools, factory buildings, and similar things shipped to Australia before the Dec. 31 deadline. Accessories and general equipment for use in the buildings have also been declared free from duty.



Here's the grip for the trip

Do your lifts consist of occasional difficult loads . . . or do you require a steady series of pickups engaging a minimum crew? In either case, flexible Yellow Strand *Braided* Safety Slings* will provide the right grip for the trip. And you'll be set to cut handling time, and to lower costs, as compared with the use of bulkier slings.

Patented *braiding* increases the pliability of stout Yellow Strand Wire Rope. A choker or basket hitch conforms readily to odd shapes, provides more security for unbalanced or slippery loads. Direct connections—via hook, thimble, shackle, socket or special fitting—are easily attached, owing to the relatively light weight and high kink-resistance of Yellow Strand *Braided* Slings. Send details of your application now for a recommendation by B & B engineers.

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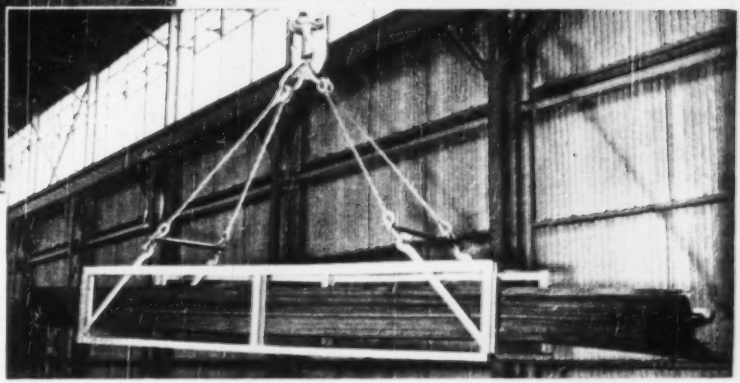
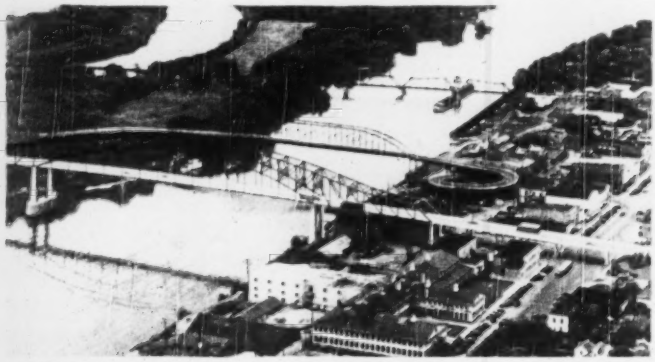


*PATENTS: U. S. 1475050, 1524071, 2142641, 2142642, 2284559; CANADIAN: 252874, 258068

MUNICIPAL AFFAIRS



NEW MISSISSIPPI RIVER BRIDGE at Hastings, Minn., will appear like this when it is completed next year. Beyond the new structure, as sketched by the artist, is the famous spiral approach to the old bridge which will be replaced.

Long service to end for spiral approach bridge

Early next year there will be a new bridge over the Mississippi River at Hastings, Minn. It will be a three-span, arched, continuous truss with a 514-ft span over the river and 226-ft side spans—and it will have long straight approaches.

This latter fact is of more than normal interest since the new structure will replace an old bridge a block away which has an unusual spiral approach that has acquired considerable fame and a good many admirers over about three-quarters of a century. One of these admirers, seeing the picture of the temporary spiral approach to a new Passaic River bridge in Newark, N. J. (ENR April 6, 1950, p. 23), took proper exception to the caption, which read "Something New in Bridge Approaches." And he set the record right with a little history.

The Hastings spiral approach resulted from an original suggestion by the late Horace E. Horton, founder of the Chicago Bridge & Iron Works. It happened this way: Some years before the Hastings bridge was built, Mr. Horton was one of a prospective group of bidders looking over the site of a proposed new bridge at Winona, Minn. He suggested that a spiral approach would avoid a long, straight ramp into the center of town. A competitor, overhead-bum, was impressed with the idea and recalled it several years later when the same problem—restricted space for an approach—came up in connection with the Hastings bridge. His company, the Wisconsin Bridge and Iron Co. of Milwaukee, bid on the job with a spiral approach design and landed the contract. The competitor was L. H. Johnson, later president of the Hennepin Bridge Co., Minneapolis, who set down this sequence of events some 25 years ago in a letter to the Chicago Bridge & Iron Works.

A spiral approach is not, therefore, a late invention. The evidence that it dates back to the last century is still plainly in evidence at Hastings, Minn., but will probably disappear shortly after the city gets its modern new crossing of the Mississippi some time next year.

News of Parking

Lincoln, Neb.—Two downtown parking garages to accommodate 850 cars are under construction.

St. Paul, Minn.—In the congested area the total average daily use of various parking facilities is as follows: Closed garages, 2,000; open deck, 200; public parking lots, 4,547; private, 900; parking meters, 15,858; curb, 6,752.

Fort Lauderdale, Fla.—Revenue bonds would finance a municipal parking lot for the downtown area. It is estimated that accommodations for 340 autos could be provided for $850,000.

Boston, Mass.—A privately financed underground garage for 700 cars is being planned for a site off Winthrop Square, bordered by Devonshire and Federal streets.

San Francisco, Calif.—Parking meters cannot be used for advertising purposes, City Attorney Dion R. Holm of San Francisco ruled recently in response to a request for an opinion from Chief Administrative Officer Thomas A. Brooks, who had received inquiries from advertising firms regarding a possible lease for meter space. Such a lease by the city, Holme said, would not be a proper exercise of the police power, nor would it be a part of the regulation of traffic. Across the bay, in Berkeley, the city council gave official endorsement of Proposition No. 3 on the June ballot, a measure giving municipalities the right to "earmark" parking meter revenues to finance city-owned off-street parking lots.

New Brunswick, N. J.—Here about 200 merchants and commercial property owners in the central business district participated in the purchase of $300,000 non-interest-bearing bonds to finance off-street parking facilities—the first time a non-interest municipal bond issue had been offered in New Jersey. The local parking authority will acquire land and develop the facilities which later will be leased to private interests.

St. Petersburg, Fla.—The St. Petersburg TIMES says the city is threatened with a staggering loss in trade and revenue unless proper measures are taken to solve the parking problem. It says that with 80,000 cars on the city's streets in the winter season and parking places for only 9,000, the parking problem has become the No. 1 headache for municipal authorities everywhere.

Propose master plan for North Jersey water supply

A master water plan to meet the needs of the northern part of New Jersey for the next 25 years has been presented to the North Jersey District Water Supply Commission, to Governor Driscoll, and to the State Water Policy and Supply Council.

The plan has been favorably received for study as a tide-over until the great Delaware River development can be completed under a tri-state authority.

With the present estimated yield of water supplies in the northern New Jersey district approximately 300,000,000 gpd, the plan calls for development of resources to increase the yield to more than 500,000,000 gpd at a cost of about $15,000,000. Incorporated in the plan is the $5,000,000 Ramapo River diversion now under way. New water supply sources would be the Delaware and Raritan Canal, and the Passaic River at or below Little Falls.

The plan also proposes that the Wanaque Reservoir, with its 29,000,000,000-gal. capacity, be operated as a "water bank" to supplement the other sources during the peak demand months of the summer.

EIMCO 104 RockerShovel

For loading rock, sand, gravel, ore concentrates or other materials, it's the 104 RockerShovel! This revolutionary new type of loading equipment is new only in the economy it provides contractors with material handling and loading problems.

The RockerShovel principle is not new — contractors who have had underground jobs are familiar with the sturdy underground models of RockerShovels, and many of them who now operate the 104 crawler mounted machine say, "This is the machine we've been waiting for."

The 104 loads at the rate of 5 yards per minute in rock or 8 yards per minute in sand and gravel using a 1¼ or 2 yard bucket respectively.

Furnished with a 48 HP Diesel engine or 30 HP Electric motor the 104 is ready to go when delivered to your property.

Eimco 104 RockerShovel is a heavy-duty machine for the toughest kind of loading jobs. See how one contractor licked his sand and gravel job — write for bulletin L1021, or see your Caterpillar Dealer.

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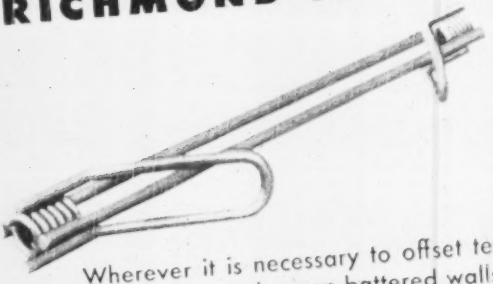
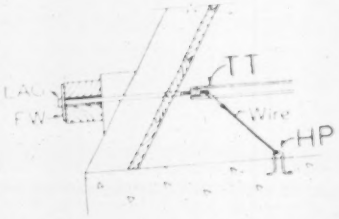
RICHMOND TIE DOWN TYSCRU



Wherever it is necessary to offset tendencies toward uplift in the form, such as on battered walls, this Richmond Tyscru is the simple and efficient answer. It is a standard 2-strut Tyscru with a 45° Tie Down Loop at one or both ends. The loop is wired to a Hairpin or Ty-loop imbedded in the footing. Richmond's Technical Department will gladly demonstrate the advantages of this device by preparing working drawings and estimates on your next job.



HOW COME ALL OF A SUDDEN THE OLD MAN TALKS LIKE AN ENGINEER ABOUT BUILDING FORMS?
WELL- HE'S USED RICHMOND KNOW-HOW SUCCESSFULLY SO LONG THAT IT'S PART OF HIM. NOW, WE CAN DO THIS JOB WHILE HE PLANS THE NEXT OPERATION.
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RICHMOND KNOW-HOW—DEPENDABILITY—SERVICE—ESTIMATES & JOB PLANNING

MEN AND JOBS

M. E. Snell has been appointed city engineer at Roundup, succeeding Frank Ticheran who resigned recently to accept a similar position at Lewistown, Mont. Snell has been a project engineer for the Montana state highway department, residing in Roundup.

Grady L. Bain, for the last nine years with the Army Corps of Engineers and for the past two and a half years resident engineer for the $76,000,000 Clark Hill hydroelectric and flood control project near Augusta, Ga., has opened offices at Greensboro, N. C., as a consulting civil engineer. A graduate of North Carolina State College, he was a civil engineer at Greensboro from 1913 to 1935 and engineer for many expansion and development projects. He served for six years as an engineer with the U. S. Department of Agriculture, being chief of development in conservation and development of government-owned lands in the Southern States. During the war he was chief of operations of the Savannah, Ga., district for military construction projects in five states.

James A. Higgins, consulting civil engineer of Pocatello, Idaho, has been appointed Bannock County surveyor at Pocatello to succeed the late W. P. Havenor.

CRITICAL SPECTATORS at a recent inspection of the Lerma water supply project in Mexico City are: Clarence E. Sterling, left, chief engineer of the Massachusetts State Department of Health; and Millard E. Smith, chief of the engineering section of the U. S. Institute of Inter-American Affairs.

Conferring at Dallas, Tex., are these three prominent members of the Southwestern division of the Corps of Engineers, left to right, Donald H. McCoskey, chief engineer; Col. Louis W. Prentiss, division engineer; and Roy G. McClure, technical advisor and engineering consultant. About $75,000,000 was spent last year on the civil works program of the Corps of Engineers in the Southwest, spread over 14 river basins in Texas, Louisiana, Arkansas, Missouri, Oklahoma, Kansas, New Mexico, and Colorado. The division also has VA hospital and major military construction work.

K. R. Pattison, a 1942 graduate of the University of Saskatchewan, has been appointed assistant city engineer of Regina, Sask., succeeding **R. W. Allen**, retired.

Sherwood Borland has resigned as city engineer and service director for Delaware, Ohio.

Miss Ethel L. Katz, employee of the Corps of Engineers at Portland, is Oregon's first woman engineer. She is a structural engineer.

Jerrie L. Flickinger has resigned as city engineer in Niles, Ohio, after eight years service.

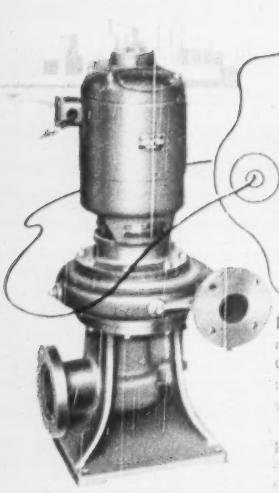
Joseph M. Tormey, of Milton, Del., a retired engineer, has been named temporary city manager of Seaford, Del.

F. E. Liebetrau, city engineer at Roundup, Mont., has been named city engineer for Lewistown, Mont., succeeding **J. M. Schmit**, Lewistown city engineer for the last 26 years. Schmit was appointed building inspector and water supervisor at Lewistown.

Francis D. Kuckuck has resigned as city manager at Celina, Ohio, after 12 years, to become safety-service director at Defiance, succeeding **William E. Dumst**. Kuckuck is a graduate of Ohio Northern University's engineering school, and was assistant engineer at Fostoria two years before going to Celina in 1930 as chief deputy Mercer County engineer. In 1936 he was elected Mercer County engineer and resigned in 1939 to become city manager. Mr. Dumst took the post of safety service director at Defiance for a limited time, with the understanding he would be relieved in the spring, so he could resume his business as a road-building contractor.

Lee Powell, of Tyler, Tex., former city manager of Temple, Sherman, and Tyler, has been made city engineer of Nacogdoches, Tex.

Grenville D. Helmer, of the Lane Construction Corp., who for the last year has been project manager in charge of construction on the Catskill Thruway, will leave shortly to assume similar duties on the grade crossing elimination project at Corning, N. Y., the largest single project ever advanced by the New York State Department of Public Works. **Milton Krantz** of Jupiter, Fla., will succeed



Type "U" Non-Clogging Pump for liquids carrying solids. Capacities to 2300 GPM, heads to 105 feet.

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Liquid handling is efficient and uninterrupted wherever Weinman Non-Clog Centrifugal Pumps are on duty. Their installation keeps your liquid moving . . . without clogging or stoppage.

Weinman engineers are thoroughly experienced in all phases of pump design and performance. If your pumping operation can be improved, they will show you how. Feel free to draw on their "short sleeve" hydraulic experience. Just write, wire or 'phone. Do it today!

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Helmer' to 'complete' the Catskill project.

Ole Singstad, consulting engineer, has removed his offices to 24 State St., New York 4, N. Y.

Lloyd D. Knapp, superintendent of sewers for the last five years, has been appointed city engineer of Milwaukee, Wis., succeeding **Joseph P. Schwada**. Mr. Knapp, a graduate of the University of Wisconsin, had been in various engineering departments in the city for the last 25 years.

Wm. S. Ekern, McLeod County, Minn., highway engineer, has been appointed state highway maintenance engineer at Mankato, succeeding **Nels Johnson**, promoted to district engineer at the same place.

Robert C. Browning has opened a structural and mechanical engineering consulting office at 1918 Hillsboro Street, Raleigh, N. C.

E. H. Small is principal civil engineer heading the maintenance branch of the Saskatchewan department of highways. He is a graduate of Queens University and a veteran of both world wars.

Wm. J. Fedeli has left Michaelson and Fedeli, architects-engineers. Irvin Michaelson will continue the practice at 1507 Fox Bldg., Philadelphia 3, Pa., under his own name.

A. G. Sullivan, who had been secretary of the Foundation Company of Canada, Ltd., Montreal, the last three years, has been transferred to Halifax, N. S., as general manager of the Foundation Maritime, Ltd.

W. S. FitzSimons, building inspector of Winston-Salem, N. C., has resigned to go with the West Construction Co.

R. A. Overmire has become traffic engineer of Youngstown, Ohio. He is a civil engineer graduate of Virginia Military Institute and has a master's degree from Purdue. He has been junior traffic engineer at Cincinnati, Ohio.

Charles M. Upham, formerly engineer-director, American Road Builders Association, has opened his offices for consulting engineering practice temporarily at the Willard Hotel, Washington, D. C., with a permanent office, after Nov. 1, in the Cafritz Building, now under construction at 1625 Eye Street, N. W.

(Continued on page 60)

Less Infiltration

TRANSITE* SEWER PIPE offers two basic safeguards that minimize infiltration in sewer lines: *tighter* joints and *fewer* joints.

Transite's special sleeve-type joints make up tight and stay tight in service.
Its long 13-foot lengths reduce the number of joints in the system.

These safeguards cut down the volume usually allowed for infiltration, reducing sewage load on the treatment plant and conserving plant capacity for future needs. Where new treatment facilities are planned, this reduced infiltration may permit consideration of a smaller plant with resulting economies.

Other Transite Economies—Transite's long lengths help maintain uniform grades, fewer joints reduce turbulence in the line. These advantages, added to Transite's unusually smooth interior, mean better flow qualities (Kutter's n=.010). This often permits designing the system with flatter grades and shallower trenches. Or, as an alternate economy, pipe of smaller diameter may be specified.

Transite Sewer Pipe is made of asbestos, cement and silica by a special manufacturing process that employs steam curing to develop greater corrosion resistance and strength. It is available in four strength classes in sizes to 36", permitting selection of the pipe best suited to trench conditions, and frequently eliminating the need for a concrete cradle.

For further details, write Johns-Manville, Box 290, New York 16, N. Y.

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If you're in the market for a new preliminary precise transit, investigate the David White Model No. 7004-L illustrated above. Compare its many features and its price to all other — You'll like what you find out! See our nearest dealer or write direct. Free Bulletin No. 1050 will give you complete details on this and David White's complete line of fine engineering instruments. David White Co., 515 W. Court St., Milwaukee 12, Wisconsin.

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We offer complete, prompt repair service on all makes of instruments — levels, transits, theodolites, etc.

Stanley E. Sporseen, civil engineer with the Portland District, Corps of Engineers, has been loaned by the Department of the Army to act as advisor to the Venezuelan Ministry of Public Works. His duties will include the selection of types of hydroelectric and irrigation dams, the planning and designing of dams, and the outlining of overall specifications for construction.

W. Arthur Riehl, executive secretary of the Westchester Allied Trades Association, Inc., and a former War Production Board official, has been appointed secretary of the Building Trades Employers' Association of New York City, succeeding the late William G. Wheeler. A business administration analyst, Mr. Riehl joined the War Production Board in 1942 as a priority specialist processing applications for construction and materials. Later he went to New York as assistant deputy director and regional priority manager. In 1946, he was appointed New York district manager of the construction division of the Civilian Production Administration which controlled the flow of materials and labor for home building.

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Ask any user . . . you'll find them everywhere

In scores of industries, users of Wickwire Rope have developed an affectionate respect for its performance, safety and long life. And, for true economy, they use Wickwire's WISSCOLAY® Preformed. It lasts longer — is easier to cut, splice and install. It's kink-resistant and safer to handle. Wickwire Distributors and Rope Engineers, in key cities everywhere, are prepared to render prompt service in meeting your wire rope needs. Wickwire Rope Sales Office and Plant — Palmer, Mass.

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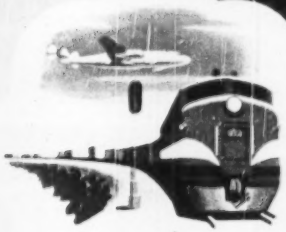
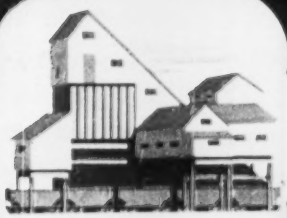
IN THE ROCKIES—The Colorado Fuel and Iron Corp. Continental Oil Bldg., Denver, Colo.
ON THE WEST COAST—The California Wire Cloth Corp. 1080—19th Ave., Oakland 6, Cal.

LOGGING

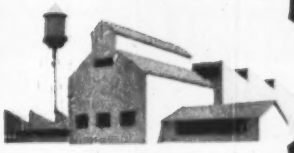


TRANSPORTATION

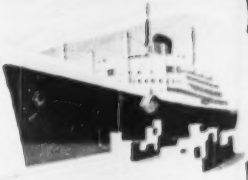


MINING

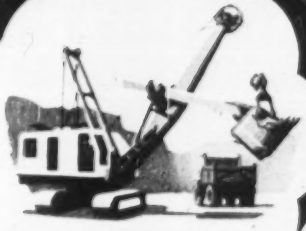
PETROLEUM



MANUFACTURING



MARINE



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Yes — here is a ½ yard shovel built to big machine specifications. Dollar for dollar, point for point — make your comparison and *you will know* BAY CITY *offers biggest value*. Look at the efficient, compact machinery assembly on the unit-cast alloy steel base, and the well-balanced construction throughout . . . Look at the other money-making features — tandem drums on separate shafts — E-Z control power clutches — 20 anti-friction bearings exclusive of engine — helical gears for quiet, smooth operation. This is only part of the story . . . *see your nearest* BAY CITY *dealer or write* BAY CITY SHOVELS INC., BAY CITY, MICHIGAN.

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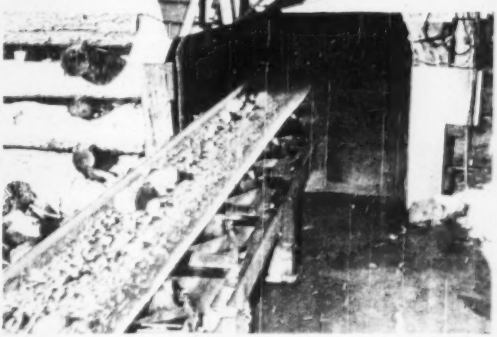
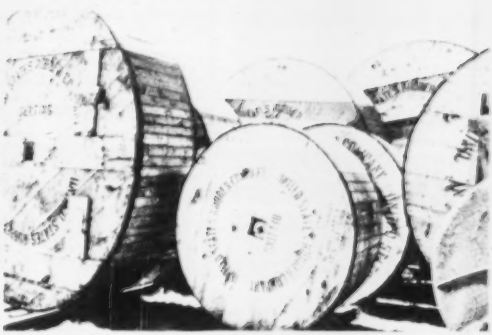
HUNGRY HORSE DAM FED BY "U.S." BELTING

Nearly 6 million tons of sand and gravel will be carried to site of mammoth job in Northwestern Montana—on U. S. Rubber Belting

NEARLY THREE MILES of U. S. Rubber Conveyor Belting, varying in width from 24" to 42", is used in all the phases of aggregate processing at the Hungry Horse Dam. Above is shown a series of the belts carrying sand material to the storage piles.



UNITED STATES RUBBER ENGINEERS worked with the construction [illegible] to assure proper equipment to [illegible] that the belt conveyors would operate [illegible] the huge Hungry Horse Dam was completed by U. S. Rubber.



A FEW OF GIANT rolls in which belts were shipped [illegible] to the Hungry Horse project of Bureau of Reclamation [illegible] Hungry Horse, [illegible] considered [illegible] by using [illegible] U. S. Rubber Reclamation

Whenever you have a problem involving materials handling, no matter how big or small, get in touch with our engineers. They will gladly cooperate with your engineers in working out a solution. Write to

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Above: Center Avenue looking north from the corner of City Park

Right: View of Second Street looking west from downtown section.

In Curtis, Nebraska low annual cost leads to 7 to 1 popularity of CONCRETE STREETS

CITIZENS of Curtis, Neb., have the unique distinction of owning perhaps more square yards of concrete pavement per capita than any other city in America—about 89 sq.yd. of concrete pavement for every man, woman and child in the city. There's a reason for this tremendous popularity of concrete.

Back in 1931, Curtis placed its first concrete paving—10 blocks, or 21,631 sq.yd. Those streets served so satisfactorily that in 1937, 18 more blocks, or 25,670 sq.yd., were paved with concrete.

Until 1948 not a cent was spent for maintaining those concrete streets. During 1948 and 1949 the total amount spent on maintenance resulted in a cost of only $.0016 per sq.yd. per yr. for the 18-yr. period.

When the citizens of Curtis were asked to express a preference, in 1949, for concrete or another type of pavement for the next project covering 36 blocks, they voted about 7 to 1 in favor of concrete, despite its higher initial cost. Years of experience had proved that it wasn't the first cost but the *annual cost* that counted. Today more than 75 per cent of the city's streets are paved with concrete.

The record of superior performance which made concrete the preferred pavement in Curtis is a familiar story in hundreds of cities from coast to coast. Concrete usually costs less to build than other pavements of equal load-carrying capacity. It costs far less to maintain and it renders longer years of uninterrupted service. These three factors result in **low annual cost.** That is the final accounting which pleases motorists and taxpayers alike.

For more information about how to design and build durable, **low-annual-cost** pavements write for your copy of a free booklet, *Concrete Pavement Design.* Distributed only in the U. S. and Canada.

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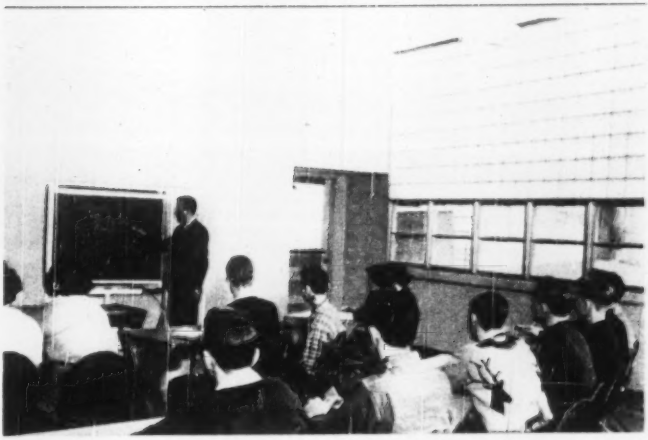

STUDENTS AND TEACHER from the Fort Allegany, Pa., High School test the improved daylighting in the demonstration classroom.

Daylighting research center

The construction of an experimental classroom building has been completed recently at Fort Allegany, Pa., by the Pittsburgh Corning Co.

Designed in accordance with the newest schoolhouse construction practices, the Pittsburgh Corning Daylighting Research Center serves as an experimental station for the testing of glass block fenestration performance, and the general development of the coordinated classroom.

The walls, ceiling, floor, desk tops and other surfaces in the room are all light in color, and as result have high reflection qualities. A panel of light directing glass blocks is on the southern exposure. This panel, it is reported, provides adequate, evenly dispersed daylight throughout the room, maintaining low brightness ratios in the field of view, which illuminating and school authorities agree are advantageous. The daylight is directed upward, by the blocks' internal prisms, toward the ceiling where it is reflected downward, evenly lighting all of the room. Thus, glass blocks of this type create a natural indirect lighting system.

Research engineers have full freedom to experiment in this test building. Comparison tests of various glass blocks patterns are easily made since certain blocks can be removed in minutes within half an hour. The mortar around a block is easily chipped away, a new block put in place, and fresh mortar tamped in the joints around the new block perimeter. Such flexibility permits illuminating expert the opportunity required for detailed study of special lighting problems.

Following the modern construction trend, the building is basementless and employs a radiant heated system in the floor. To illustrate further the versatility of glass, a cellular glass insulation was used around the edge and under the entire floor slab to reduce heat loss into the ground. This same insulation was also used in the roof and walls. Gypsum plaster was applied over a vermiculite plaster base coat to the insulation of the interior walls, and Portland cement stucco to three of the exterior walls.

Recommend general study for engineering students

A program of general studies for college engineering students "to develop a sense of highest social responsibility" was proposed at a recent regional convention of the American Society for Engineering Education at Lehigh University. William A. Aiken, professor of history at Lehigh, serving as moderator at the panel discussion, said, "Higher education should first of all seek to encourage intelligent criticism and evaluation of past and current religious, philosophical, social, economic, and scientific theories and doctrines in order to develop a sense of social responsibility in each individual for the welfare of his neighbor and mankind as a whole." In general, engineering education has found its loyalties divided until specialization and narrow professional interests have led to a shirking of more fundamental issues."

Aiken proposed a program of general studies for the engineer. In the freshman year, man would be studied

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Simple design and rugged construction, skilled workmanship and highest grade materials account for the fact that there is no repair problem on M & H Hydrants. M & H Hydrant users of many years standing say there simply never is need for hydrant repairs.

M & H Hydrants are standard A. W. W. A. type. Dry top, revolving head, easy to lubricate. They have extremely high efficiency because the barrel diameter is not reduced and there are no working parts or obstructions in the waterway.

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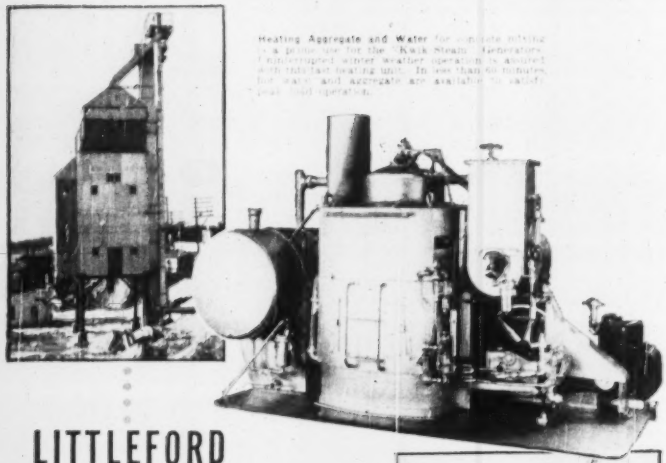

Heating Aggregate and Water for concrete mixing is a prime use for the "Kwik Steam" Generators. Uninterrupted winter weather operation is assured with this fast heating unit. In less than 60 minutes, hot water and aggregate are available for asphalt plant operation.

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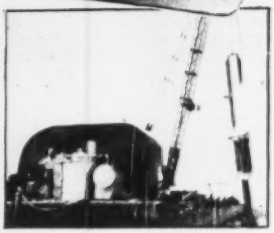
FOR PILE DRIVING
AGGREGATE HEATING
ASPHALT PLANTS



Pile Driving Contractors have found "Kwik-Steam" Generators the ideal source of steam for pile driving hammers. The fast steaming qualities of these units are especially suited to the intermittent demands of pile driving operations.

These "Kwik-Steam" Vapor Generators are the most modern steam heating units for asphalt plants and other industries. From a cold start the Littleford "Kwik Steam" Generators will produce steam in two minutes time. Designed for one-man operation and fast heating, these units are available in Mixed Current Electric, Asphalt Fuels, Propane or Natural Gas models. Automatically controlled, the "Kwik Steam" Generators supply steam as needed. The flasher cycle of whip steam is not limited. Once the "Kwik Steam" Generators are started, automatic controls are set and keep a predetermined pressure of steam. Safety in operation is assured by many proof controls. Since the "Kwik Steam" Generators burn low cost fuel oil, hard fuels are required as in the use of hand fired boilers. Other uses for the "Kwik Steam" Generators are cleaning Aggregate Cars, Water Heating, Operating Steam Heated Heating Equipment, Heating Asphalt Tank Cars, Loading to Asphalt Plants and Curing Concrete Blocks. "Kwik Steam" Generators are made in three sizes, 2, 3 and 5 tons of steam per hour.

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Faculty News

Edward Stanley, professor of engineering at the Pennsylvania State College, has been appointed director of the School of civil engineering at Georgia Institute of Technology. He was graduated from the University of Wisconsin with the degree of BS in civil engineering in 1934, and MS in civil engineering in 1940. In 1942 he became assistant professor of sanitary engineering at North Carolina State College. He also served as director of the North Carolina State Engineering Experiment Station and worked with the Army specialized training program.

Ara recently joined with the U. S. Public Health Service, he worked in the construction of sanitary engineering works. In 1945 he returned to N. C. State College, remaining there until 1947 when he became professor of sanitary engineering at Penn State.

Prof W. H. Rovey is director of the summer camp of the civil engineering department, University of Illinois at Buck Duck, Minn. Members of the civil engineering staff at the summer session will be George E. Dix, C. S. Disney, R. A. Seaton, W. L. Conway, E. E. A. Stucki, D. W. Lodge and J. C. Chilcoter.

Frederick H. Kellogg, professor of steam engineering at the University of Mississippi, Dr. Kellogg has not assigned a successor but plans to be married at an undisclosed date in June. Dr. Kellogg, a graduate of Penn State, received his degree in mechanical engineering in 1923. He received his master's degree in steam engineering from Columbia University in 1924 and his doctorate in engineering from Columbia in 1931. He has been a member of the faculty of the University of Mississippi since 1924.

TOUGH "TALLAPOOSA CROSSING"

called for

TOUGH J&L WIRE ROPE

J&L STEEL

Above: Pulling a 150-foot section of steel pipe into the river bed with J&L Wire Rope connected to the drum of a winch tractor.
Left: Four side-boom tractors, equipped with J&L Wire Rope, guide the pipe into the river.

Midwestern Constructors, Inc., lays gas pipe lines . . . uses J&L Wire Rope in vital operations

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Here was the situation: A steep slope . . . swollen waters and swift currents . . . solid granite river bed. But in six weeks the job was finished despite adverse conditions, including cold and rainy weather.

Wire rope cable [illegible] across the river to anchor equipment against swift currents. A trench five feet deep and 318 feet long was blasted in the river bed. Two "cats," side-boom "cats," a backhoe, and a clamshell went to work cleaning out shattered rock and moving the pipeline into position—all equipped with J&L *Preformed* Wire Rope.

Like many other large contractors, Midwestern Constructors, Inc., of Tulsa, Okla., has standardized on J&L Wire Rope for all its heavy-duty equipment. And for good reason. They have found that J&L Wire Rope lasts longer on tough jobs, raises the safety factor and reduces down-time resulting from wire rope replacements.

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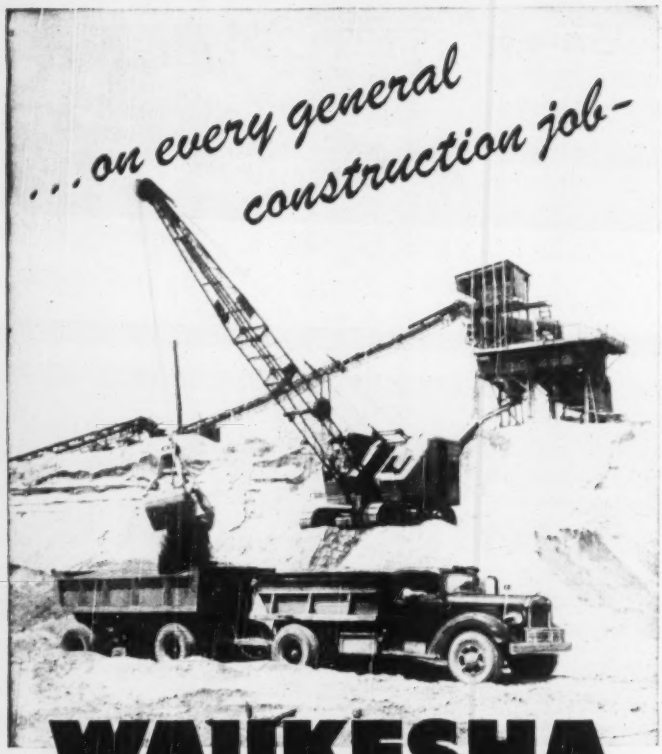
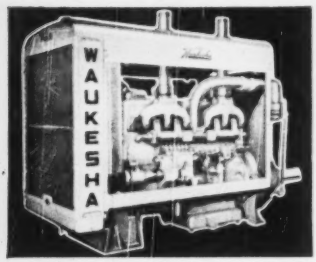


WAUKESHA *Diesel* POWER UNITS



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ELECTIONS AND ACTIVITIES

Ralph Ross, of Battelle Institute, is chairman of the Columbus, Ohio Technical Council, which represents 22 groups. Other officers are Walter Williams, Ceramic Supply Co., Crooksville, vice-chairman; Thomas Shevlin, Ohio State University Experiment Station, secretary-treasurer.

Robert W. Lawson of Butte, has been elected president of the Montana Society of Engineers. Other officers: O. A. Dingman of Butte, first vice-president; J. R. Butto of Great Falls, second vice-president; R. D. Piper of Butte, secretary-treasurer; and P. K. Ramsey of Butte and W. H. Meyers of Virginia City, trustees.

Robert A. Blackburn, Pittsburgh, has been elected president of the Pennsylvania Society of Professional Engineers.

C. Arnold Dutton installed as president of the Erie County Chapter of the New York State Society of Professional Engineers. Other officers: W. E. S. Dyer, first vice-president; Edward S. Bundy, second vice-president; F. Brandon Burke, recording secretary; H. Carlos Frank, corresponding secretary; and Richard C. Wohler, treasurer.

MAJOR MEETINGS

New England Industrial Wastes Conference, Massachusetts Institute of Technology, Cambridge, Mass., June 26-28.

Pennsylvania Water Works School, [illegible], June 26-29.

Ohio Sewage & Industrial Wastes Treatment Conference, Hotel Gibson, Cincinnati, Ohio, June 28-29.

Annual Conference on the Small Community, Yellow Springs, Ohio, June 30-July 2.

American Society of Civil Engineers, annual convention, Royal York Hotel, Toronto, Ont., July 12-14.

Maine Water Utilities Association, summer meeting, Mt. Desert Island, Me., Aug. 9.

Pennsylvania Water Works Operators' Association, annual conference, Nittany Lion Inn, State College, Pa., Aug. 21-22.

Pennsylvania Sewage & Industrial Wastes Association, Nittany Lion Inn, State College, Pa., Aug. 22-23.

At the Crompton & Knowles Looms Works
WORCESTER, MASS.

3 engineering department routines simplified

with Kodagraph Autopositive Paper

FILING

A low-cost photographic intermediate paper that produced positive copies directly was "big news" for Crompton & Knowles, world's largest manufacturer of specialty looms. To begin with, it meant that they could reorganize their filing system much faster and much more economically than had been estimated. *Here was the problem:* they had some 200,000 detail drawings—4 to 8 on each sheet of paper. Many of these were not in sequence, which slowed reference; and when blueprints of only one part were needed, it meant a waste of paper . . . besides taking the attached drawings out of the files. *Solution:* the design sheets were re-produced on Kodagraph Autopositive Paper, then the prints were cut and filed correctly in the "master" file.

• • •

DRAFTING

Crompton & Knowles has adopted the rule: "*A Kodagraph Autopositive intermediate of every drawing.*" And this is paying off today in lower re-drafting costs. *Before*, the original detail drawings (described above) and scale drawings were used as the blueprint "masters" . . . were exposed to machine wear-and-tear, constant handling. When they no longer produced legible blueprints, they had to be redrawn. *Now* the valuable originals are kept safe in the files—available for reference and revisions only. The "Autopositives" do the "heavy work" . . . whenever needed.

• • •

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Using Kodagraph Autopositive intermediates, Crompton & Knowles turns out sharper, cleaner blueprints—at uniform, practical machine speeds.

That's because these new intermediates have an evenly translucent, high-quality paper base . . . and dense photographic black lines which will not smudge or lose opacity even after hundreds of trips through the machine.

How "Autopositives" are produced: Crompton & Knowles uses its blueprint machine for exposure; standard photographic solutions for processing. In this manner it gets positive copies directly—without a negative step . . . without darkroom handling.

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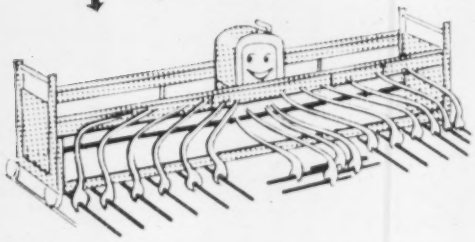

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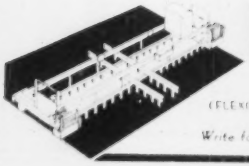

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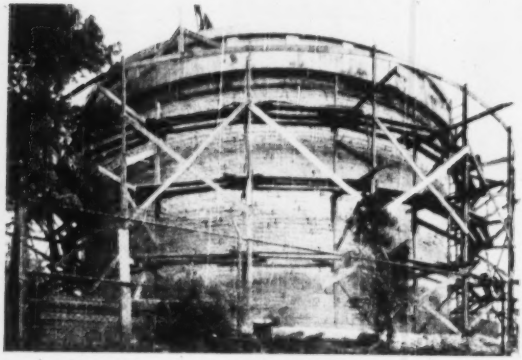

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OBITUARY

Normal S. Powell, 72, civil engineer credited with originating the idea for Pymatuning Dam and reservoir in Ashtabula County, Ohio, and western Pennsylvania, died in Sharon, Pa., on June 6. In 1905 Mr. Powell, a civil engineer for the Carnegie-Illinois Steel Corp.'s Farrell, Pa., works, suggested the dam at the headwaters of the Shenango River to save Sharon and other lower river valley cities from annual flood ravages. After years of effort, his proposal was favored by the Pennsylvania Legislature, and the project was completed in 1934, giving ample water supply and flood relief. After Powell retired from active life, he was named resident engineer at the dam, serving ten years.

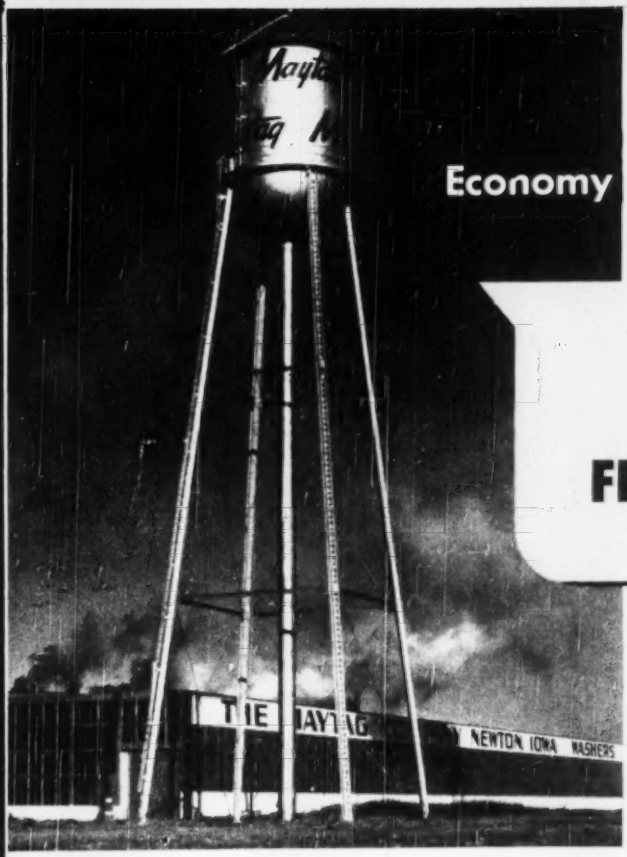
Albert C. Fischer, 72, Chicago, developer of an expansion joint for concrete roads, died May 31 in Petoskey, Mich.

Clarence Leslie Handley, Sr., 60, state maintenance engineer for the West Virginia Road Commission since 1947, died June 4 at Charleston, W. Va., from injuries in an automobile accident. A member of the commission's engineering staff since 1933, Mr. Handley had also served as engineer for the city of Dunbar.

Hendree Paine Simpson, 78, of Arlington, Va., retired Naval Hydrographic Office cartographic engineer, died May 25. He was with the Hydrographic Office nearly 50 years before retiring in 1944. He was an 1891 civil engineering graduate of the University of Alabama. He went to Washington in 1892 to work for the Coast and Geodetic Survey, transferring shortly to the Hydrographic Office. There he held successively the positions of hydrographic draughtsman, chief of the lithographic section, chief of the compilation section, and chart editor.

John Moore Picton, 47, chief planning engineer, City Planning Commission of Kansas City, Mo., for the last 7 years, died May 19 in Washington, D. C. A civil engineering graduate of the University of Cincinnati in 1925, Mr. Picton was an outstanding authority in traffic survey and municipal planning. From 1929 to 1939 he was with the Hamilton County, Ohio, Regional Planning Commission, following which he was director of traffic surveys for Memphis, Tenn., and planning engineer for Charleston,

Continued on page 72



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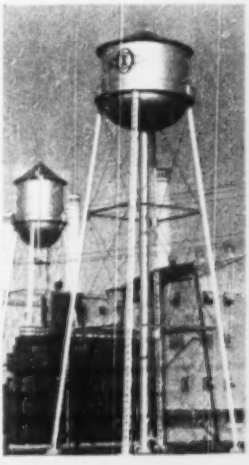

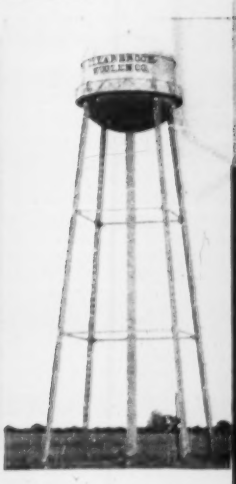

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W. Va. During the war he served with the National Resources Planning Board and the National Housing Agency.

N. Y. State to help White Plains to solve housing

Consideration of a plan to help provide a solution of the need in White Plains, N. Y., pop. 50,000, for additional housing for its low income families, clearance of deteriorated buildings in substandard areas, and the provision of adequate parking space or a site for a new bus terminal near its traffic-choked shopping centers, without cost to the city, has been recommended by N. Y. State Housing Commissioner Herman T. Stichman. The commissioner discussed the possibility of a state loan to White Plains of about $2,500,000 to be channeled through its housing authority, coupled with cash subsidy payments by the state of up to about $85,000 annually, to build a public housing project for about 225 families with rentals of about $8.95 per room monthly, including heat, light and cooking fuel. This might permit the use of as much as $225,000 to clear substandard buildings from land near a shopping center which would be given to the city for parking or bus terminal purposes. The plan is dependent on the availability of a suitable site for the housing project. This would have to be practically vacant, to permit clearance of substandard buildings in another area, and determination of the extent of the need for additional low rent housing for families of low income.

The White Plains Housing Authority, of which Emil Stratemann is chairman, is now completing the first section, to accommodate 270 families, of a 480-family public housing development of Fisher Avenue.

Akron's new R.R. station. The new $2,000,000 railroad station at Akron, Ohio, built jointly by the Pennsylvania and B & O railroads, was opened recently. The main part of the building is faced with large squares of limestone, with yellow brick wings on either side. Along the base across the entire front of the building, a facing of gold-shimmering polished granite has been used. Over the sidewalk for the entire width of the building extends a canopy of aluminum. Main doorways are of bronze. Leading off from the main waiting room is a long concourse which extends over the tracks and joins with a bus terminal at its opposite end, thus providing the city with an integrated transportation center for the convenience of the public.

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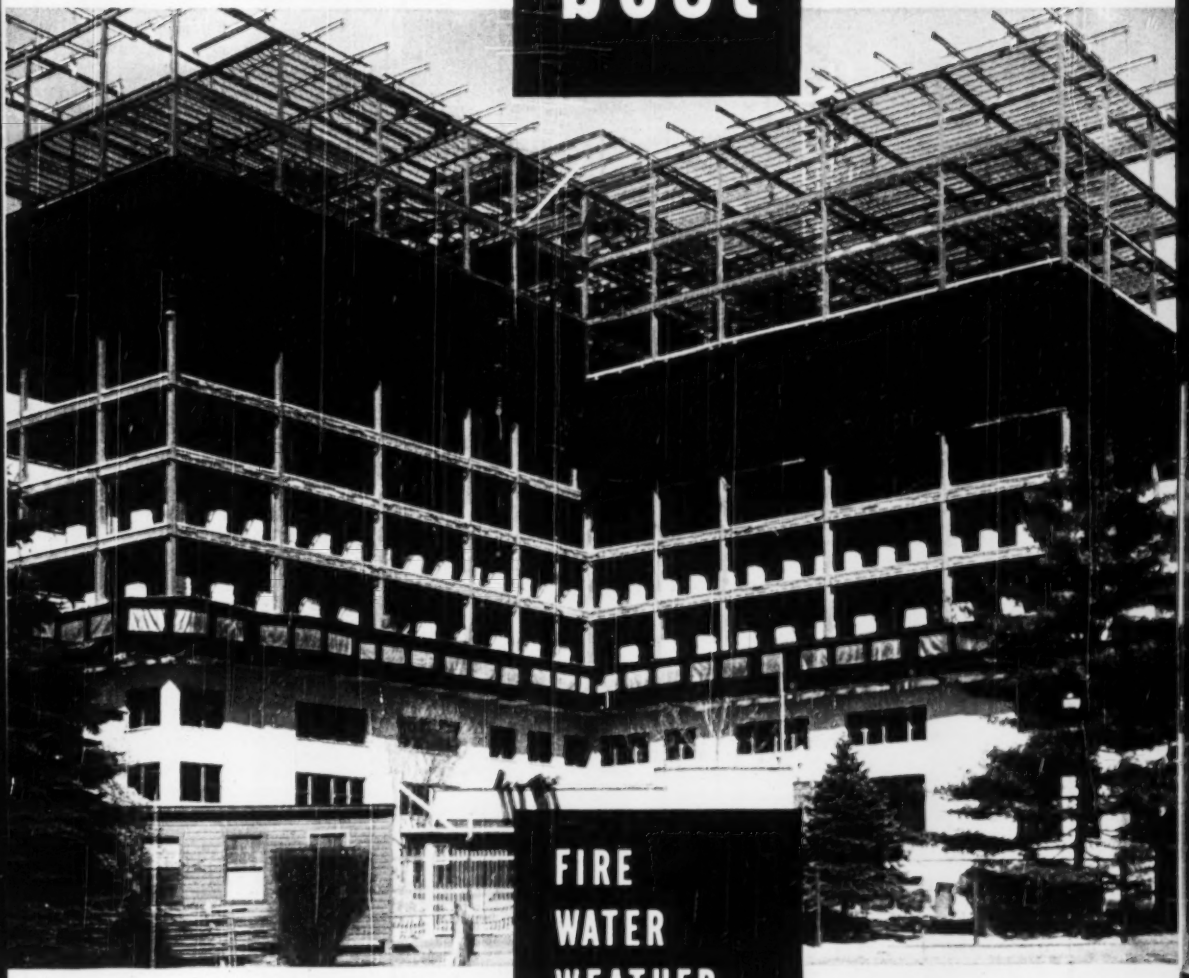

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- Built for one-man operation; has easily handled electric cable.
- Designed for concretes of 2" slump and over: walls, footings, columns, floor and roof slabs; precast piles and similar products.
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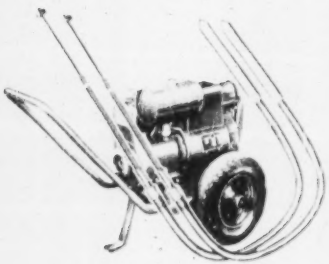
- Extension hose handle permits use in forms 25 feet deep.
- Equipped with waterproof switch.



Two CP-220 Vibrators are powered with a CP-2KW gasoline-driven Generator, 220-volt, 3-phase, 180-cycle. Generator can also be used to operate flood lights.

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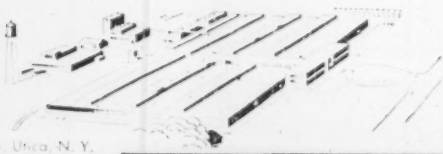

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UNIT PRICES BID BY CONTRACTORS

Paving parking fields, Rockaway Beach, N. Y.

Bids on three parking fields requiring 22,000 sy of asphaltic concrete paving plus toll booths and landscaping were taken April 4, 1950 by New York City Park Commission. Contract for $143,708 was awarded on the low bid, 12% below the second and 23% below the high bid. Six of the seven bids were under the engineer's estimate.

All labor and materials are furnished by the contractor. Wages prevailing in part, are: carpenters, $2.75; steel reinforcing workers, $2.75; road roller operators, $2.625; asphalt raker, $2.05; tamper, $1.97; top shoveler, $1.05; asphalt workers, $1.85; common laborer, $1.70, all working on a 40-hr. week on heavy construction. Work on toll booths would be on a 7-hr. day.

1. Mac Asphalt Concr. Co., Flushing, N. Y., contract $143,708
2. John C. Peterson Concr. Corp., Baldwin, N. Y. 161,867
3. Petrocco & Sons, Inc., Jamaica, N. Y. 182,279

Items	Quan.	Unit	Unit Prices 1	Unit Prices 2
Demolition	lump	lump	$ 500	$1,000
Excav. on face	cy	2,000	$1.00	$1.25
Borrowed fill	cy	2,000	2.00	2.25
Fine grading	sy	25,000	.10	.10
Asph. concr. pave, prk. fds.	sy	22,000	2.00	2.15
Portland cement	bbl	2,400	3.50	3.50
Cement. concr. pave	cy	1,500	18.00	18.00
1st el. concr. (1-2-4)	cy	32	20.00	20.00
2nd el. concr. fence ftgs. (1-2-4)	cy	70	18.00	20.00
Concrete curb	cy	200	34.00	30.00
St. bar reinf.	lbs	2,000	.20	.18
St. fab. reinf.	sy	300	.12	.10
Misc. iron & st.	lbs	22,000	.12	.11
Cross timb. & bumb.	Mfbm	3	350	350
Salt tr. decking	sf	500	.75	.75
Gran. block pave.	sy	30	7.00	7.00
Pvt. concr. pipe, 12"	lf	1,700	1.25	1.60
Broken stone	cy	650	5.50	6.50
Brick masonry	cy	97	60.00	57.50
Sign—type A	ea	3	25.00	25.00
Sign—type B	ea	3	50.00	20.00
Fence, 6' ch. link	lf	1,100	3.00	3.40
Single gate, 6'	ea	1	150	200
Double gate, 12'	ea	6	350	410
Roding, ramp & talk	lf	200	6.00	5.00
Painted lines	lf	25,000	.02	.02
Topsoil	cy	500	3.00	4.00
Manure, well rotted	cy	62	8.00	9.00
Beach grass	ea	3	350	350
Pinus thunbergi 3'-4'	ea	195	5.00	9.00
Pinus thunbergi 5'-6'	ea	120	12.00	22.00
Elaeagnus aurebeka 2'-2½" Cal.	ea	10	15.00	22.00
Prunus mariticus 2'-3'	ea	165	2.50	3.00
Rosa rugosa 18"-24"	ea	1,720	1.00	1.10
Toll booths	ea	1	1,000	1,500
Electrical work	lump		1,000	1,500

Gen. Mitchell Airfield additions, Milwaukee, Wis.

Milwaukee's airport expansion, requiring 150,000 sy of 12-in. concrete paving and 169,880 sy of 12-in. granular base course, went to a local contractor for $849,243. This is 13% below the engineer's estimate, 16% below the high bid and 5% below the second low bid. A St. Joseph, Mo., contractor was the only invader of this otherwise all-Milwaukee bidding. Apr. 27, Thomas Congress to import engineers.

This job includes grading, draining, apron paving, runway widening, turfing and electrical duct wiring. All materials are furnished by the contractor. Work must be completed in 180 working days. The site is 2 miles from a railhead.

Wages to be paid are: common labor, $1.80; semi-skilled, $1.95; skilled $2.85.

1. J. D. Bonness, Fountain $849,243
2. Federal Paving Corp. 870,681.14
3. Stark Const. Co. ..... [illegible]

Items	Quan.	Unit	Unit Prices 1	Unit Prices 2
Grading	cy	250,000	$0.12	$0.24
Concr. pave. reinf.	sy	1,355	.80	.75
Underdr. 8" perf. ft. gr.	lf	19,000	2.05	2.31
Pipe, St. dia. 15 ga.	lf	1,520	2.50	3.00
30", 10 ga.	lf	280	2.80	3.64
42", 10 ga.	lf	500	2.35	4.30
15", 16 ga.	lf	650	2.70	3.00
18", 16 ga.	lf	500	3.10	4.69
21", 16 ga.	lf	810	3.70	4.94
24", 14 ga.	lf	90	4.10	5.35
24", 12 ga.	lf	320	5.40	6.56
36", 14 ga.	lf	310	7.20	8.69
36", 12 ga.	lf	430	9.50	10.62
36", 10 ga.	lf	330	11.10	13.96
42", 14 ga.	lf	230	8.60	9.92
42", 12 ga.	lf	130	10.90	12.10
Pipe arch				
29"x18", 14 ga.	lf	500	7.50	9.30
50"x31", 12 ga.	lf	1,130	15.10	16.91
50"x31", 10 ga.	lf	800	19.30	21.10
Type A inspec. holes	ea	11	75.00	60.00
Catchbasin, Type C	ea	24	150.00	250.00
Type F	ea	2	125.00	110.00
Inlet, Type B	ea	1	350.00	400.00
Type B-1	ea	2	400.00	450.00
Type F	ea	3	1,800	2,000
Type G	ea	1	1,000.00	900.00
54" RCP, lay & inst.	lf	70	3.00	3.00
Ditch inspec.	lf	1,500	.50	.70
Headwall repair	ea	1	100.00	100.00
Granular bkfill under pave.	cy	190	3.00	3.00
3" dia. 6 duct bank				
2 layers	lf	340	3.50	4.04
4 layer	lf	2,400	3.15	5.10
3" galv. metal duct	lf	150	2.00	2.38
3" 12 duct bank				
4 layers	lf	2,715	3.50	6.34
Elect. manholes	ea	9	1,150.00	210.00
12" granular base crse.	sy	169,880	.72	.65
12" conc. pav. CLA	sy	150,000	3.60	3.25
Crushed agg. base crse.	cy	4,555	.80	.75
Bit. prime coat B-1	gal.	3,424	.22	.24
2" C Bit. binder crse.	ton	225	10.00	10.00
¾" bit. top crse.	ton	165	10.00	10.00
Seal coat B-1	sy	2,165	.22	.21
Limestone chips	ton	65	6.00	7.00
Earthwork	cy	85	15.00	14.00
Seeding, 60# rate	sy	30	40.00	30.00
Undrgr. cable, trench	lf	500	.50	.65
Conduit	lf	500	.25	.20
Box, lgts. reloc.	ea	4	15.00	24.50
Misc. photocell lighting cont.	ea	1	525.00	800.00

Standpipe, Douglas, Mass.

The 250,000-gal. welded steel stand-pipe for Douglas, Mass., went under contract to the second low bidder for $11,580, exclusive of foundation. This is 4.63 cents per gal. of capacity. With flat bottom and umbrella type roof, this standpipe will be 51 ft. in diam., 46.5 ft. to high. Weston & Sampson, Boston, are consulting engineers.

Bids were opened April 4, 1950, for work to start at once. Both rail and highway transportation to available. Wage rates range from $1.40 per hr. for common labor to $2.80 for skilled.

Bids and completion schedules are:

1. Hammond Iron Works, Everett ..... $12,000 (1 mo.)
2. Chicago Bridge & Iron Co., Chicago ..... 12,500 (1 mo.)
3. A. O. Robinson Boiler Works, Worcester ..... 13,900 (1 mo.)
4. Pittsburgh-Des Moines Steel Co., Pittsburgh ..... 14,000 (1 mo.)
5. Bethlehem Steel Co., Bethlehem ..... 15,000 (1 mo.)

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ALL TYPES
FINE WORKMANSHIP
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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — J. A. MAHONEY, Reports — M. R. ROESSLER, Statistics

PROPOSED PROJECTS

WATER SUPPLY

Fla., Gainesville, City general engrg. extens. to W.S. syst., $600,000. Smith & Gillespie, Consulting Engrs., Gainesville. Zone 1 engrg. supv.

Tex., Brownfield, City extens. engrg. supv., $200,000.

Tex., Freeport, Brazos River Harbor Navigation Dist., engrg. supv. for water supply system, $200,000. A. Ross Smith, Freeport, engr.

Tex., Rio Grande City, Water system improvements, $100,000. A. J. Van Zandt, engr., Houston.

Tex., San Benito, City, water lines, $100,000; water supply, extens., $150,000.

Tex., Texas City, City W.S. system extens., $300,000.

▲ Va., Chesterfield County, [illegible] $1,100,000. Burns & Wilcox, Consulting Engrs., 50 Church St., N. Y. 7.

SEWERS, WASTE DISPOSAL

N. Y., Port Henry, Dist. No. 1, San. Sewerage Extens., $100,000.

Tex., Bellaire, [illegible] $40,000.

Tex., Brownfield, City, [illegible] $250,000.

Tex., Houston, [illegible] $50,000; storm sewers, $50,000.

Tex., Junction, City, sanitary sewer improvements, $60,000; storage & disposal facilities, $60,000. Marsden & Jones, Texas Trust Bldg., Austin, engrs.

Tex., Livingston, City, sewage treatment plant, $75,000; sewer extens., reporting sanitary sewerage syst., $100,000. McCormick & Secker, 2216 Grand Ave., Houston, engrs.

Tex., Rio Grande City, Starr County Water Control & Improv. Dist. 2, Rio Grande City, sanitary sewerage syst., $150,000. A. J. Van Zandt, engr., Houston.

Tex., San Benito, City, water lines, $100,000; sewer extens., $125,000; sanitary sewerage system, engrg. supv., $125,000. [illegible] engr.

Tex., Texas City, City, sewage treatment plant, $250,000; interceptor sanitary sewer line serving West Sect. and new receiving sta., Eastern Section, $375,000. Joe J. Wells, 810 Rosenberg Bldg., Fort Worth, engr.

Wis., Walworth, Village, sewerage syst., $248,271. Bonner, Keeler & Woodman, City of Lake, engrs.

BRIDGES

N. J., Pemberton, Burlington Co., Main Street, Rancocas Rd. to the river, Rancocas River, $126,000. Clay L. Wilson, Pleasantville, engr.

North Carolina, Edenton, N. C. Div., Raleigh, Chowan and Bertie Counties, [illegible] Edenton, Chowan River, [illegible] engrg.

Tex., Freeport, Brazos River, [illegible] $100,000.

▲ Tex., Houston, [illegible] $15,000,000.

STREETS AND ROADS

Ark., Little Rock, [illegible] Mississippi St. from E. 6th to Mayor Hubert Ze Rucker, $200,000.

Calif., San Diego, [illegible] $267,846.

Tex., Johnston City, [illegible] $252,836.

West Sidney, City, [illegible] $617,500.

Tex., Freeport, Street, water, sanitary sewer, storm sewer improvements, $139,000.

Wash., Port Angeles, [illegible] $60,000.

EARTHWORK, WATERWAYS

Ark., Tyronza, [illegible] $303,000.

▲ Washington, [illegible] $1,224,300.

AIRPORTS

+ Ore., Portland, [illegible]

LATIN AMERICA

Mexico, Acapulco, [illegible] $350,000.

Mexico, Mexico City, [illegible] $250,000.

Mexico, Mexico City, [illegible] $250,000.

PUBLIC BUILDINGS

Conn., Norwich, [illegible] $425,000.

PROJECTS COVERED

Projects—By Size

Proposed projects here reported cover the United States and Canada at these minimum sizes or types: waterworks, waterways $25,000; industrial buildings $65,000; [illegible]

Classes of Construction

(Alphabetical order of Listing)

Water Supply — Latin America
Sewers, Waste Disposal — Public Buildings
Bridges — Commercial Buildings
Streets & Roads — Industrial Buildings
Earthwork, Waterways — Miscellaneous

Stages Reported

Except as noted, beginning appointment of engineers or architects. For full explanation of symbols used see last previous issue published.

Bids Asked: Only new proposals are listed. Unless otherwise noted, bids are received at the office of the owner. Except where award is not to be made for [illegible] a supplementary report will be published.

Contracts Awarded: Only new awards to low bidder are listed. Unless otherwise noted, projects listed were not previously published.

Symbols and Abbreviations Include:

\+ Report of appointment
▲ Project of $1,000,000 or over
B.A. Bids Asked
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

▲ Fla., Orlando, [illegible] $1,000,000.

▲+ Idaho, Ariel, [illegible] $6,000,000.

▲ Ill., Downers Grove, [illegible] $1,500,000.

Ia., Vinton, [illegible] $650,000.

▲ Kan., Atchison, [illegible] $1,375,000.

Kan., Lenexa, [illegible] $600,000.

Kan., Olathe, [illegible] $125,000.

▲ Md., Catonsville, [illegible] $2,000,000.

▲ Md., Rockville, [illegible] $1,388,530.

▲ Mass., Brookline, [illegible] $1,000,000.

Mo., Eureka, [illegible] $400,000.

▲ N. J., Passaic, [illegible] $3,500,000.

N. Y., Flushing, [illegible] $500,000.

▲ N. C., Lumberton, [illegible] $1,260,000.

N. C., Wilkesville, [illegible] $600,000.

▲ N. C., Wilmington, [illegible] $1,925,000.

▲ O., Middletown, [illegible] $700,000.

Tex., Eagle Lake, [illegible] $400,000.

Tex., Grand Prairie, [illegible] $350,000.

▲ Tex., Houston, [illegible] $350,000.

▲ Tex., San Antonio, [illegible] $1,500,000.

Continued on page 78

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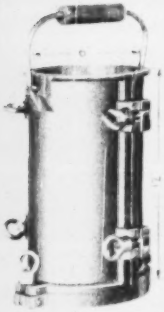

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COMMERCIAL BUILDINGS

▲ Calif., Los Angeles, SCHOOL OF DENTISTRY, Engineering Unit, University of California, Mixed Use Building, Westwood Blvd. and Gayley Ave., Los Angeles, Owner: Regents of University of California, Los Angeles, Architect: Welton Becket & Associates, Los Angeles, Engineer: Edward H. Fickett, Los Angeles, Contractor: Webb & Knapp (California), Inc., Los Angeles, Cost: $1,600,000

Calif., Santa Barbara, DWELLING, Mixed Building, Owner: Mr. and Mrs. Robert Fleming, Architect: Lutah Maria Riggs, Santa Barbara, Contractor: Owner, Cost: $750,000

▲ Calif., Ventura, DWELLING, Fountain Realty Co., 1350 S. Beverly Dr., Los Angeles, Owner: Edward H. Fickett, Los Angeles, Architect: Wayne Pierce, Los Angeles, Engineer: Edward H. Fickett, Los Angeles, Contractor: Owner, Cost: $2,350,000

▲ D. C., Washington, DWELLING, Apartment, Owner: Arthur Nevins, Architect: Nevins & Aver, N. W., Washington, Engineer: Nevins & Aver, N. W., Contractor: Owner, Cost: $225,000

▲ D. C., Washington, OFFICE BUILDING, Owner: Federal Housing Administration, Architect: Office of Public Buildings and Public Parks of National Capital, Washington, Engineer: Office of Public Buildings and Public Parks of National Capital, Washington, Contractor: Owner, Cost: $5,000,000

Fla., Fort Lauderdale, DWELLING, Apartment, Owner: Thompson Theater Co., 225 N. Andrews Ave., Fort Lauderdale, Architect: Marvin L. Manning, Miami, Engineer: Marvin L. Manning, Miami, Contractor: Owner, Cost: $750,000

▲ Ill., Chicago, DWELLING, Apartment, Owner: Maxwell Morse and Jack Silverman, Architect: Nimmons, Carr & Wright, Chicago, Engineer: Nimmons, Carr & Wright, Chicago, Contractor: Owner, Cost: $1,000,000

▲ Ill., Springfield, DWELLING, Apartment, Owner: Kenneth Stern, Architect: Bostwick & Co., Springfield, Engineer: Bostwick & Co., Springfield, Contractor: Owner, Cost: $1,300,000

Ind., Gary, DWELLING, Apartment, Owner: Kreisa Realty Co., 222 Fisher Bldg., Detroit, Architect: Stuck and Bunker Engineers, 225 W. Huron St., Chicago, Engineer: Stuck and Bunker Engineers, 225 W. Huron St., Chicago, Contractor: Owner, Cost: $500,000

Ind., Marion, DWELLING, Apartment, Owner: Nick Athanas, Architect: Owner, Engineer: Owner, Contractor: Owner, Cost: $400,000

▲ Mo., Kansas City, DWELLING, Apartment, Owner: Ninth Kansas City Corp., Architect: Owner, Engineer: Owner, Contractor: Owner, Cost: $5,000,000

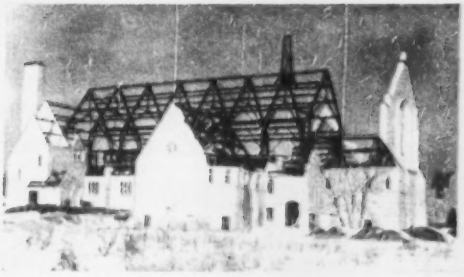
▲ Mo., St. Louis, DWELLING, Apartment, Owner: Lowell Realty Co., 1 Metropolitan Square Bldg., St. Louis, Architect: Owner, Engineer: Owner, Contractor: Owner, Cost: $1,500,000

▲ Mo., St. Louis, DWELLING, Apartment, Owner: Lowell Realty Co., 1 Metropolitan Square Bldg., St. Louis, Architect: Owner, Engineer: Owner, Contractor: Owner, Cost: $1,500,000

▲ Mo., St. Louis, DWELLING, Apartment, Owner: Lowell Realty Co., 1 Metropolitan Square Bldg., St. Louis, Architect: Owner, Engineer: Owner, Contractor: Owner, Cost: $1,500,000

▲ N. J., Jersey City, DWELLING, Apartment, Owner: Jersey City Housing Authority, Architect: Owner, Engineer: Owner, Contractor: Owner, Cost: $1,611,611

THE CONGREGATIONAL CHURCH OF MANHASSET, Manhasset, New York. Fabricated and erected by American Bridge Company. This 222 ton structure consists of church proper—45' x 72' chapel—28' x 80' Minister's study—25' x 25' parish hall—45' x 95' school wing—42' x 102' and belfry-steeple—35' x 35'. Architects—Magoon and Saho. Consulting Engineers—Wilson and Erickson.

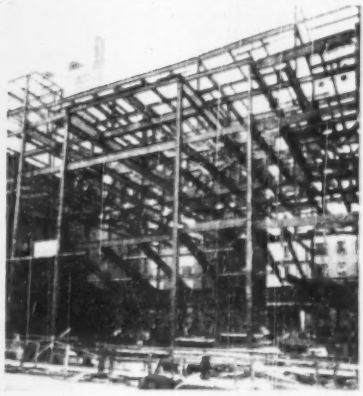


THE MOUNT OLIVET LUTHERAN CHURCH, [illegible] and Lowry Avenue, South, Minneapolis, Minnesota. Fabricated by American Bridge Company. One hundred fifty tons of structural steel was furnished for this structure. Architect—Roger C. Hauser.

For sanctuaries, too—

A FRAMEWORK OF STEEL

THE HOLY ANGELS CHURCH, Gary, Indiana. Fabricated and erected by American Bridge Company. The church building, 100' x 36'—has seating for 1,000 and over the choir. One hundred thirty tons of structural steel comprised the framework of this structure. Architect—A. J. Meconi.



THE FREE SYNAGOGUE, 30 West 68th Street, New York City. Fabricated and erected by American Bridge Company. This 90 ton, 4 story building with balcony framing to seat 1,000, has Architects—Bloch and Hess. Engineer—A. D. Gruzen.

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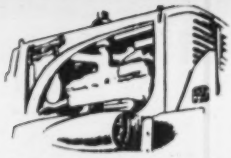
UNITED STATES STEEL



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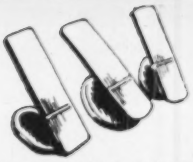
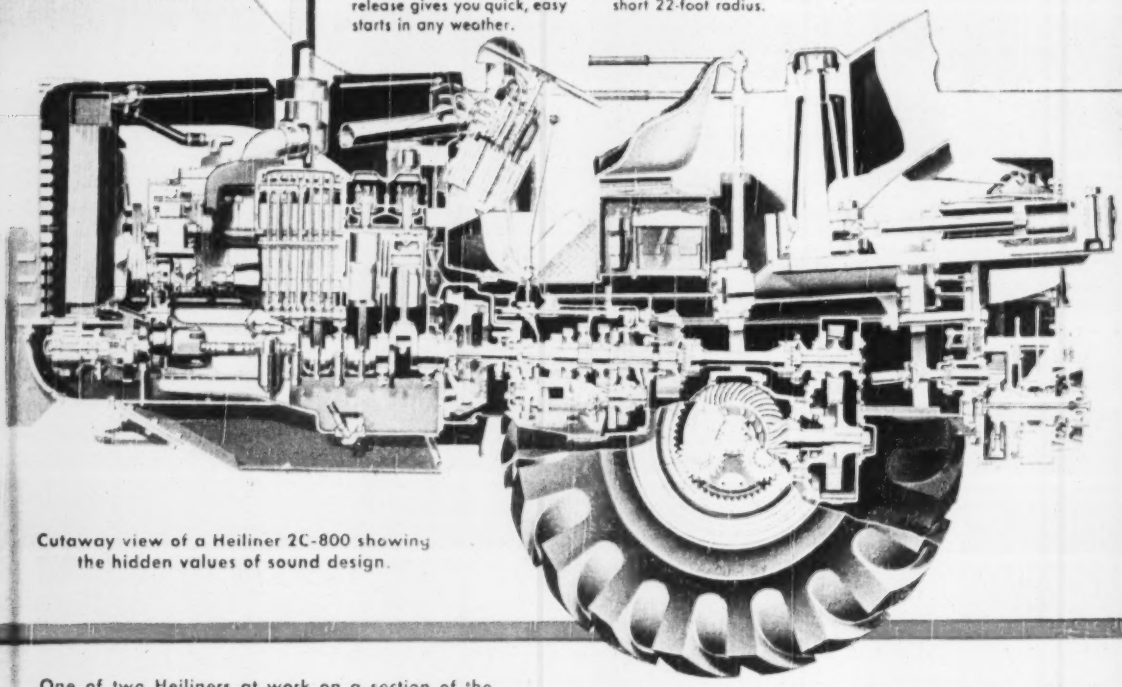
Patented Hydro-Steer. Makes handling effortless. Eliminates jack-knifing, oversteering. You can turn the Heiliner with one hand in a short 22-foot radius.

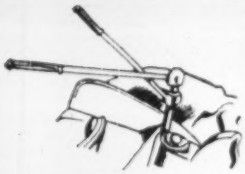


Air-assisted clutch. Clutching is much easier for the operator—helps make him more productive, reduces fatigue.



Cutaway view of a Heiliner 2C-800 showing the hidden values of sound design.

One of two Heiliners at work on a section of the Massachusetts Mid-Cape Highway project. The Heiliner 2C-800 is available with an 18-cu. yd. scraper or 20-cu. yd. bottom-dump wagon.



Adjustable control levers. The Heiliner cable power-control unit is within finger-tip reach. Control levers are adjustable to suit operator's convenience.

Good visibility. No obstructions block operator's vision ahead or behind. He can always see how he's doing — for maximum loads and faster haul cycles.

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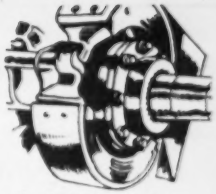

4-wheel brakes. Heavy-duty two-shoe air brakes. Also auxiliary hand controls provided.

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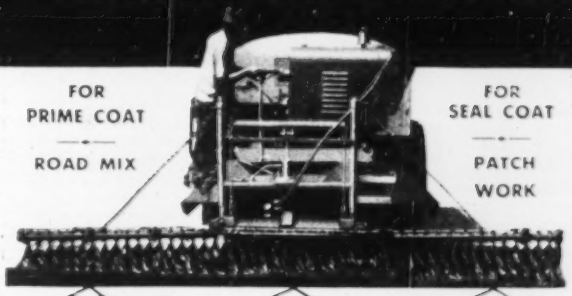

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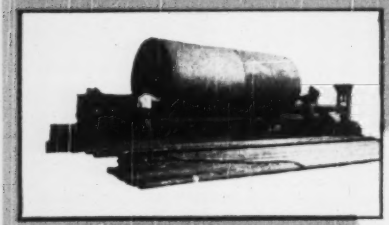
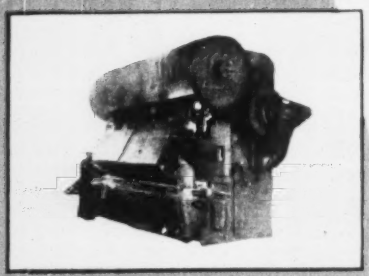
that Engineers often need but Fabricators seldom publish



32-foot roll bending steel plate. One of the new equipment units in Posey's 13½ acre North Plant.



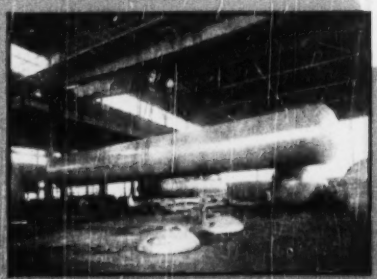
Giant sixteen-foot power brake for ½" steel plate in the Plate Shop where floor space totals more than 98,000 square feet.

Engineers purchasing steel plate construction often ask themselves the question: "Has this supplier the capacity and the equipment to do the job according to specifications and on time?"

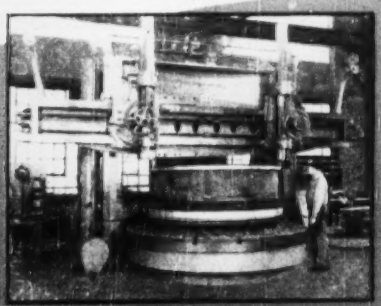
Usually, they are offered little definite information that would help them make a decision. Recently, however, Posey Iron published a 12-page reference bulletin giving details about Posey capacity and equipment.

Located in Lancaster, Pa. . . . a railroad and highway center . . . the modern plants of the Posey Iron Works cover an area of 16½ acres under roof. Manufacturing advantages provided by this extensive, modernized plant often permit the Posey Iron Works to meet both "special" and standard requirements with greater skill . . . greater speed . . . and greater economy. Materials are carefully selected to meet specifications and liberal allowance is always made for safety factors.

To learn of facilities that may lower your steel plate construction costs, write today for your free copy of the Posey Production Facilities Bulletin.



This 50-ton crane (37-foot headroom) allows quick, easy handling of sizeable units like this butane tank.



This 16'6" vertical boring mill is one of many new tools in the fully equipped machine shop.

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SHIPBUILDING
STEEL PLATE

(Continued from page 83)

Kansas — RURAL DISTRICTS ... $400,000

Kansas — RAILROAD STATION ... $160,000

Minnesota — RURAL DISTRICTS ... $160,000

Nebraska — GAS LINES ... $729,335

N. Y. Brooklyn — FACTORY ... $260,000

N. Y. Elamore Center, near Buffalo ... $500,000

North Dakota — RURAL DISTRICTS ... $105,000

▲ O. Cleveland — MILL ... $7,000,000

Oklahoma — RURAL DISTRICTS ... $780,000

Oklahoma — RURAL DISTRICTS ... $955,000

Pa. Conshohocken — FACTORY ... $100,000

▲ South Carolina — RURAL DISTRICTS ... $1,030,000

South Carolina — RURAL DISTRICTS ... $110,000

South Carolina — RURAL DISTRICTS ... $350,000

▲ South Dakota — RURAL DISTRICTS ... $1,095,000

▲ Tennessee — RURAL DISTRICTS ... $1,575,000

▲ Texas and Mississippi — GAS LINES ... $32,928,630

Texas — RURAL DISTRICTS ... $320,000

▲ Texas and New York ... $39,300,600

Tex. Dallas — WATER SYSTEM ... $503,300

▲ Tex. Freeport — AIRBASE ... $1,250,900

Tex. LaPorte — WATER SYSTEM ... $50,000

▲ Va. Lynchburg ... $1,000,000

Wash. — FACTORY ... $250,000

Wisconsin — RURAL DISTRICTS ... $125,000

WATER SUPPLY

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S. C. Bamberg ...

Cleveland ...

S. C. ...

Tex. Dallas ...

Que. Sillery ...

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BIDS ASKED

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Md. Hyattsville ...

N. Y. Rockaway ...

Ariz. Lead Hill ...

Wash. Richland ...

Calif. Goleta ...

Tex. Cockrell Hill ...

Tex. Arlington ...

Tex. Houston ...

Ala. ...

▲ O. Cleveland ...

CONTRACTS AWARDED

S. C. Fairfax ...

LOW BIDDERS

▲ Fla. Tampa ...

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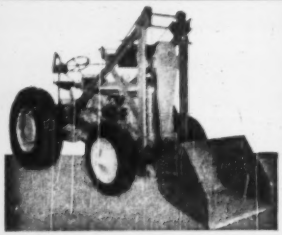

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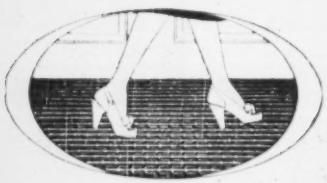

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way Ave., $233,396; and $75,610, respectively.*** Dr. 12, Sesqui Ave. Force Main, from Stanley Mundy & Co., 7n Billing Rd., Norfolk, va., $470,465. ***Dr. K-4, impr. sewage treatment plants and Dr. K-5, impr. sewage treatment plant, from Thomas Bryan & Assoc., M. & M. B.'s, Houston, Tex., $525,156; and $419,894, respectively. Dr. K-5, from Worth Hydraulic Const. Co., P. O. Box 6, Richardson, Tex. Dr. W-1, Atlanta, Ga., $47,551.*** Dr. M1, from Turner & Armstrong Wells, Inc., 301 S. Morgan St., $64,555. CD 5/2.

Pa.* Altoona, Authority, City Hall, June 6, primary sewage disposal plant. Contr. 1, structural work, from H. E. Moose Co., 115 Nail Mark Bldg., Pittsburgh, $587,461. Contr. 2, mechanical work, from Russell Foster Yates & Co., 1 and 6 Gateway Sq., Detroit, $152,000. CD 5/3.

▲ R. I., Providence, Water Supply Board, June 6, Blackstone Valley sewer, first stage, intercepting sewers, third section of sewage treatment plant, contract for treatment plant, and appurtenant works, and for pumping stations, and appurtenant works, from Merritt-Chapman & Scott Corp., 63 Wall St., New York, N. Y., and Walsh Const. Co., 2 Wall St., Providence, $2,983,076. Est. $2,750,000. CD 4/27.

CONTRACTS AWARDED

▲ Fla., Sarasota, City, City Hall, sanitary sewers, storm drains, and disposal plant, Contr. 504-14, from Wright Const. Co., 504 14th Ave., Columbus, Ga., $644,827 and $147,494 respectively. Work awarded 5/23 under LB.

Fla., Winter Haven, City, sanitary sewer improvements, from S. G. Constr. Co., Ft. Myers, $196,142. Est. $175,000. CD 4/27.

Ga., Atlanta, Fulton Co., Courthouse, Contr. 1, sewers, Contr. 2, storm drains, to Rapid Transfer & Storage Co., 760 Whitehead Ave. N. E., $103,253. Work awarded 5/19.

La., Lafayette, City, City Hall, sanitary sewer improvements, from Bert Broussard, Inc., Box 1, Breaux Bridge, $914,315. Bids 5/23. CD 5/29, under LB.

N. Y., Merrick (Town Hall, Town Hall, Hempstead, June 6, sewage treatment plant, Dist. 1, Type "A" Contact Aeration, from Cerami & Son, 2 N. Central Ave., Mineola, $709,533. CD 5/10.

Wis., Milwaukee, City, storm sewers, W. Atkinson Ave., from A. Jaus Co., 5240 W. State St., Zone 8, $67,173. Bids 5/23. Awarded 6/5.

BRIDGES

BIDS ASKED

Ont., Weston, Co. of York, Toronto & York Roads Commission, 1 steel highway bridge, 1 reinforcement river, Plant Rd., Weston, Approaches of Toronto, Dept. 4-24-50.

N. Y., New York, N. Y., Triborough Bridge Authority, Construction of new bridge, Contr. 7, over Bronx Kill, between Randalls Island and Bronx, Contr. 8, over Harlem River Ship Canal, between Randalls Island and Manhattan, Contr. 9, over Harlem River Ship Canal, between Wards Island and Manhattan, Contr. 10, over Bronx Kill, between Wards Island and Bronx, Contr. 11, over Harlem River Ship Canal, between Wards Island and Bronx, Contr. 12, over Harlem River Ship Canal, between Wards Island and Bronx, Contr. 13, over Harlem River Ship Canal, between Wards Island and Bronx, Contr.

STREETS AND ROADS

BIDS ASKED

New Jersey (B. A. 6/29) New Jersey Turnpike Authority, Prospect St., Trenton.

Union Co.—Contr. 58, grading, surfacing and necessary incidental work on connection (Airport Circle) between Sta. 445 and Sta. 674 +/- (Newark Airport), Kearny, Harrison & Newark; Contr. 59, Ray Lindfors & Thorndike, 31 Livingston St., New Brunswick, engr.

† Tex., Fort Sam Houston (B. A. 6/30) U. S. Quartermaster, Fort Sam Houston (resurf. reconstruct service roads, S 23 and S 23) Tw. No. F 41 [illegible] 50-42. Approx. $200,000.

LOW BIDDERS

▲ California—State Div. Hwys., Sacramento, (June 7) plant mix or cement treated mounted base material surf. 9.4 mi. between Hollister and Santa Clara Co. line, San Benito Co., from Knox Grading & Paving Co., 873 81 Ave., Oakland, $414,120.

Plant mix surf. 4.8 mi. between Hollister and Castro, Monterey Co., from Granite Construction Co., Watsonville, $1,035,424.

Illinois—State Hy. Dept., Springfield, (June 7) [illegible] 19 mi. concrete base course [illegible] Vadwin Co., L. R. $693,196. CD 6/7.

▲ Iowa—State Hy. Comm., Ames, (June 6) [illegible] $353,976. S 146 mi. F 642 [illegible] Jasper Co., $219,402. S 245 mi. F 642 [illegible] Jasper Co., $116,973. S 146 mi. F 642 [illegible] Jasper Co., $361,062. S 891 mi. Powershiek Co., $116,926. *** from Peter Kiewit Sons' Co., 1024 Omaha National Bank Bldg., Omaha, Neb. paving 6.144 mi. F 642 [illegible] $320,410. 6.751 mi. F 642 [illegible] $44,230. Keith Jasper Co., *** from Lisle Corp., Marion, grading 6.144 mi. F 642 [illegible] $84,413. 6.144 mi. F 642 [illegible] $82,201. *** from Kiewit Sons' Co., bituminous base Dallas Co., Davenport, paving 0.653 mi. F 672 [illegible] Muscatine Co., $78,638. *** from Kiss Construction Co., 2001 Farm Bureau Bldg., Des Moines, [illegible] 1.476 mi. F 206 [illegible] Div. 1, Polk Co., $598,837.

▲ Maryland—State Rds. Comm., Baltimore, (June 7) [illegible] 1.837 mi. beginning at Delaware line, Worcester Co., Expressway, northerly to Ocean City, [illegible] 1.1 mi. [illegible] and extending northeasterly to northern side of Harrison Blvd., Contr. AA-MR 7-156, F.A. FT 445 (15), Anne Arundel Co., from Nello L. Teer Co., Durham, N. C., $428,041. crusher run sub-base mixed base course and penetration macad. surf. course 1.425 mi. beginning at Ellicott City, Rte. 104, beginning at Ellicott City, Rte. 104, beginning at Ellicott City, Rte. 104, and extending southwesterly through Alberton to Rte. 40, Contr. B-204-45, Howard Co., from Bituminous Construction Co., 14 Water St., Frederick, $511,008. CD 6/27.

▲ Maryland—State Rds. Comm., Baltimore, (June 7) grading, drainage, surf. [illegible] 1.1 mi. beginning at Clarksville and extending southwesterly to Valley Summit, Contr. A-423-615, Allegheny Co., from Cumberland Contg. Co., Box 1, Cumberland, $466,761. *** grading, drainage, surf. 1.387 mi. [illegible] Rockville and extending northwesterly toward Gaithersburg, Contr. M-455-115, Montgomery Co., from Corman Eng. & Constr. Co., Box 137, Branchville, $512,610. *** [illegible]

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Pa., East Stroudsburg—DORMITORY—B.A. 6/28. General State Auth., 18 and Herr Sts., Harrisburg, general contract, heating, plumbing, electrical work, elevator for men's dormitory, Shawnee Hall, at East Stroudsburg State Teachers College. $500,000. Plans, deposit $10 each. Walker & Kiefer, 2 and Monroe Sts., archts. A. F. Jones, c/o owner, ch. engr. CD 4/24.

▲ Pa., Torrance—EMPLOYEES, etc.—B.A. 6/25. General State Auth., 18 and Herr Sts., Harrisburg, general contract, heating, plumbing, electrical work, elevators of male employees bldg., Torrance State Hospital. $500,000. Plans, deposit $10 each; nurses' home, $400,000. Plans, deposit $10. Sorter & Moore, 1st Natl. Bank Bldg., Greensburg, archts. A. F. Jones, c/o owner, ch. engr. CD 4/25.

▲ Wis., Madison—HOMES—B.A. 6/28. University of Wisconsin, men's residence halls, Langdon St. Approx. $1,500,000. Plans, deposit $25. Law, Law & Potter, 27 W. Monroe Ave., Chicago, archts. Kenneth Morton, state archt. CD 11/11/45.

N. S., Greenwood—SCHOOL—B.A. 6/28—R. J. Mahon, pres., Central Mortgage & Housing Corp., 132 Cuthbert St., Halifax, Stage II school at R.C.A.F. Station. Tender "Longwood I-50." R. C. A. F. Station Schools, Approx. $300,000. Plans, deposit $50.

Ariz., Tempe—HOME ECONOMICS—B.A. 6/29. State Arizona Univ., Tempe, Ariz., 1950 appropriation. Home Economics Bldg. Stanley Underwood & Mahoney, Title & Trust Bldg., Phoenix, archts.

▲ Conn., Bridgeport—DRAINAGE—B.A. 6/29—City of Bridgeport, Bd. Public Purchases, to receive bids for furnishing and installing chemical sewage elevated spray facilities, fan work, fan washing equipment and steel work. Lindsay & Johnson, 211 State St., archts. CD 2/1/49.

Conn., Manchester—SCHOOL—B.A. 6/29. Bd. Educ., Manchester, Manchester Consolidated High School. Mansfield & Assoc., 16 Haynes St., Hartford, archts.

▲ Wis., Hattiesburg—HOSPITAL—B.A. 6/29. Hattiesburg Hospital, $1,000,000. Plans, deposit $25. Landry & Matthews, 1st & Main Sts., archts. CD 12/17/47.

N. C., Greensboro—STUDENT UNION—B.A. 6/29. Women's College of University of North Carolina, Greensboro, student union. Plans deposit $25 each for general contract and mechanical work. Northrop & Johnson, Reynolds Bldg., Asheville, archts. CD 12/21/49.

S. C., Columbia—[illegible]

S. D., Huron—AUDITORIUM-ARENA—B.A. 6/29. Huron Auditorium-Arena, $750,000. Huron Sportsmen Club, Inc., Huron, S. Dak. Bids to South Dakota State Purchasing Agent, Pierre. CD 12/1/49.

Wash., Chehalis—[illegible]

Wash., Pasco—[illegible]

Wis., Sheboygan—HOSPITAL—B.A. 6/29. Memorial Hospital, [illegible] Plans deposit $25. Eschweiler & Eschweiler, 735 N. Water St., Milwaukee, archts. CD 12/16/49.

N. Y., New Hartford—[illegible]

+ Alaska, Fairbanks—[illegible]

Ga., Summerville—[illegible]

▲ Ill., Elgin—[illegible]

Calif., Long Beach—ARMORY—B.A. [illegible] Architecture, P. W. [illegible] Plans deposit $25. Anson Boyd, Veterans' Bldg., [illegible]

Calif., Napa and Mount Shasta—ARMORIES—B.A. [illegible] Anson Boyd, State Architect, Veterans' Bldg., [illegible] Plans deposit $25 each. Anson Boyd, State Architect, [illegible]

▲ Pa., Wyalusing—PATIENTS—B.A. [illegible] State Auth., 18 and Herr Sts., Harrisburg, general contract, heating, plumbing, electrical work, elevator for [illegible] Wyalusing State Hospital. $1,000,000. Plans, deposit $10 each. Walker & Kiefer, 2 and Monroe Sts., Pittsburgh, archts. A. F. Jones, c/o owner, ch. engr. CD 4/25.

O., Elyria—[illegible]

+ Mich., Dearborn—HOSPITAL—B.A. 7/18—veterans Admin., Vermont Ave., between N and T Sts., N. W., Wash., D. C., alterations, additions to Building 100 and addn. water supply, veterans Administration hospital, spec. 1622. CD 12/29/49.

▲ Ia., Keokuk—SCHOOL—B.A. About 12/1—Keokuk Bd. Educ., c/o John W. Conrad, supt. Bldgs. & Grounds, rein. con. brick steel, Senior High School, $1,250,000. Parking & Walks, 309 W. Jackson St., Chicago, Ill., archts. CD 12/29/49.

LOW BIDDERS

+ Ala., Birmingham—WAREHOUSE—Dist. Army, National Guard Bureau, Ala. State Military Dept., P. O. Box 2331, Birmingham, warehouse, [illegible] Roberts, 1710 N. 23 St., $73,435.

Calif., Los Angeles—SCHOOL—City Bd. Educ., 1425 S. San Pedro St., Jure 2 Colfax Ave. School, Van Wagner & Cremer, 5942 Cahuenga Blvd., $269,920. Est. $285,000. CD 5/19.

Colo., Aurora—[illegible]

[illegible]—[illegible]

[illegible]—[illegible]

▲ Conn., Waterbury—HOUSING—City of Waterbury, Housing Auth., 74 Harper St., June 6, 277 Family Housing Units, Rice Drive, NW of Main St., [illegible] $2,824,700.

[illegible]—[illegible]

[illegible]—[illegible]

[illegible]—[illegible]

La., New Iberia—CHURCH—B.A. ... Catholic Church, ... New Iberia. Church ... 7/24/44.

Tex., Marshall—DORMITORY—B.A. ... Baptist College, Marshall. Boys' dormitory, 202 student capacity. ... Fort Worth Ave., Dallas. Engr. and Archt. ... 7/24/44.

Ill., Chicago—APARTMENT—Bids Awarded: Emanuel Grubsky, c/o Ernest H. Mandel, ... Zone 11. 3 story, 73x172 ft., 18 unit apartment, 5745 Sheridan Rd., $840,670.

Ill., Mundelein—RETREAT—... Mary of the Lake Seminary, 214 story, buff brick, stone reveal, tunne... $2,500,000. McCarthy & Smith, 64 W. Delaware St., Chicago. Zone 10. Archts. ...

Ont., Toronto (North York)—HOUSES—Bids Asked: W. A. Dempsey, c/o Sterling Trusts Corp., 372 Bay St., Toronto. 33 houses, Haree Ave., North York. Approx. $275,000.

SOON LETS CONTRACT

Ala., Birmingham—OFFICE—... Van Keuren, Davis & Co., archts. and engrs., Brown Bldg., Birmingham. Soon lets contract. $300,000. CD 6-16, under LB.

Calif., Lodi—HOSPITAL—... Assn., 200 W. Pine St., ... assist, contribute to cost of new hospital. $500,000. W. D. Peugh, 444 Montgomery St., San Francisco, archts. CD 10-31, under LB.

La., New Orleans—OFFICE—Curtis & Davis, archts. and engrs., 827 Tchoupitoulas St., ... concrete frame, steel deck, ... Bryanna St. for Dr. Howard Carroll, 1734 Dorothea St.

▲ O., Akron—ASSEMBLY HALL—... Paul's Lutheran Church, 215 E. Market St., ... Church, 2545 N. Howard St., Akron. Assembly hall, 6x140 ft., parish house, W. Market St. and Kenilworth Dr. $1,000,000. Evan A. Fenz, room 248, Exchange St., Boston, Mass., archts. CD 4-27-49.

LOW BIDDERS

▲ Tenn., Kingsport—HOSPITAL—... Kingsport Memorial Foundation, Charles H. Mackey, archt., Jackson Bldg., Birmingham, Ala., rejected bids May 10. Hospital, ... B. $1,789,987. CD 4-6, under LB.

▲ Tenn., Nashville—FIELD HOUSE—... University, Nashville. June 1 field house and gymnasium. Hart, Freeland & Roberts, Inc., Arcade-Supreme Bldg., Nashville. $1,277,400. CD 4-27.

▲ Wis., Milwaukee—HOSPITAL—... Bldg., 220 W. Michigan St., ...

$1,041,343. CD 4-13.

CONTRACTS AWARDED

Calif., Beverly Hills—HOUSING—Beverly Hills Corp., c/o William H. Perkins, 7421 Beverly Blvd., 4 story, $2,000,000, 66 ft. steel, ... Medical Bldg., to Webb & Knapp, Inc., 2403 Riverside Dr., Los Angeles. Architect, $700,000.

Calif., Concord—HOUSING—Lockwood Constr. Co., 1110 E. 14 St., Oakland, 33 residences in Concord Estates tract. Owner builds. $255,915.

Calif., Los Angeles—DWELLINGS—Coronet Constr. Co., 5733 Lankershim Blvd., 100 frame dwellings, Van Nuys and Ranchito Sts. Owner builds. $800,000. Edward H. Fickett, 5657 Wilshire Blvd., archt.

Calif., Los Angeles—DWELLINGS—Granview Bldg. Co., 410 S. Beverly Dr., Beverly Hills, 147 houses, Zeh and Kenneth Rd. and Lincoln St. Owner builds. $581,400. Allen Siple, 4507 Santa Monica Blvd., Beverly Hills, archt.

▲ Calif., Los Angeles—HOTEL—... Ave. and 4th St., New York, N. Y., general contract to ... Los Angeles, State ... Wilshire Blvd., for Edward M. Mike ... Robert E. McKee, 4700 San Fernando Rd., West. $15,000,000*** Heat ... $3,000,000 to Wering & Hansen Co., 6611 E. Ave. ... $1,500,000*** Electric ... to Consolidated Western Steel ... Eastern Ave., Los Angeles, and ... $1,500,000*** Elev. ... Knox Bldg., Pittsburg, ... $1,100,000*** Elevators, ... to Elevator Supply Co., 348 N. ... Cleaning, ... 16th Terrace, Kansas City, Mo. ... $900,000. Grand total, $24,500,000. B.O. 5-15, 4-27.

Calif., Los Angeles—MEDICAL—Pacific Property Inc., c/o Gruen & Krummeck, 8460 Santa Monica Blvd., 4 story, 42,000 sq. ft. medical bldg., Alvarado ... Angeles. Owner builds. $670,000.

▲ Calif., Palm Springs—HOTEL—... c/o Kenneth ... Wing, general ... Palm Springs, resort hotel and motel, ... Alvarado & Wrigley, 1221 W. 16 St., ... DeWitt, 1750 Fenimore, ... San Fernando. Architect, $1,256,000.

Calif., Pico—DWELLINGS—Todd Constr. Co., 239 N. Highland Ave., ... Angeles, 114 studio, ... 204 1/2 Torres, Calif., for Todd and Smith Aves., to Halper Constr. Co., 233 N. Highland Ave., Los Angeles. Approx. $925,382. Southwest Testing Service, 2427 W. Temple St., Los Angeles, soils ...

Calif., Whittier—HOUSING—M. A. ... $500,000. ...

Conn., Windsor—HOUSING—Arthur G. Wood, Maple St., ... 2 story, panel, frame houses, Scarborough Ave., Lawler Bldrs. $700,000. CD 5-11.

D. C., Washington—MASONIC—... University, 37 and O Sts., N.W., 114x186 ft., Fisher, McDonough, Memorial gymnasium, ... storage, lower room, ... Masonic temple, 1733 N. St., N.W., archt. ... Awarded 4-22 to ... Waterfall, 1727 K St., N.W. CD 1-24-49.

Fla., Miami—HOTEL—... Biscayne ... contractor, note to Edward M. ... Corp., 1194 N. Miami Ave., $801,052. B.O. 3-16, CD 4-16, under LB.

Ga., Macon—HOUSING—... Lawler Bldrs. $300,000.

Ill., Chicago—APARTMENT—... Ernest H. Mandel, archt., 154 E. Chicago St., Zone 11. 78 unit, 71x172 ft. ... apartment, 5745 Sheridan Rd. to Inland Constr. Co., 114 N. Constr. Co., Zone 2. $840,670. Awarded 6-16, CD 6-6.

Ill., Chicago—STORE, etc.—... Schenck & Esser, archts., 225 N. Michigan Ave., Zone 11. 5 story, ... Wabash and Lake, Zone 11, to ... Wabash and Lake, Zone 11, to ... Chicago Ave., Zone 10. Approx. $900,000. Awarded 6-1.

▲ Ill., Chicago—HOUSING—Parkway Gardens Trust, c/o Lt. ... Hollman, Hollman, Kreisman & Taylor, archts., 14 S. State St., Zone 3. 404 unit housing ... Park Ave. and 61 and 63 Sts. and ... and 64 and 65 Sts. to Patrick Warren Constr. Co., 53 N. Kedzie St., Chicago. Zone 12. $3,102,820, and $2,193,440 to ... contractors.

▲ Ill., Chicago—APARTMENT—... Lakeshore Dr., Zone 14. 11 story, ... apartment, ... Zone 11. ... $2,500,000. Awarded 5-31 to ... Bldrs., 111 N. Wabash Ave., Zone 2, archts.

▲ Ill., Jacksonville—HOSPITAL—... $2,000,000.

▲ Ia., Markham—HOSPITAL—... between Waterloo and ... Dearborn St., Chicago, ... to Homer Lewis, Dearborn ... Approx. $1,400,000. ... Engineers, 224 S. Michigan Ave., Chicago. Archts. ...

La., West Monroe—HOUSING—... Monroe, W. Monroe, La. ... $500,000.

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DUMPCRETES

Look around, at big jobs and small jobs. Notice the Dumpcretes. Why are they there? Because they *haul* and *place* more concrete *in a day* ... for less. Concrete men tell us they save a dollar a yard and more.

The Dumpcrete is the ideal concrete body. It loads fast at the central mixer. It handles easy on rough ground. It dumps and places fast ... through a long, 12-foot adjustable chute. Its cost is low ... only 33% that of many truck mixers ... and it mounts on a lighter and lower-cost truck. Maintenance is low ... there are few moving parts.

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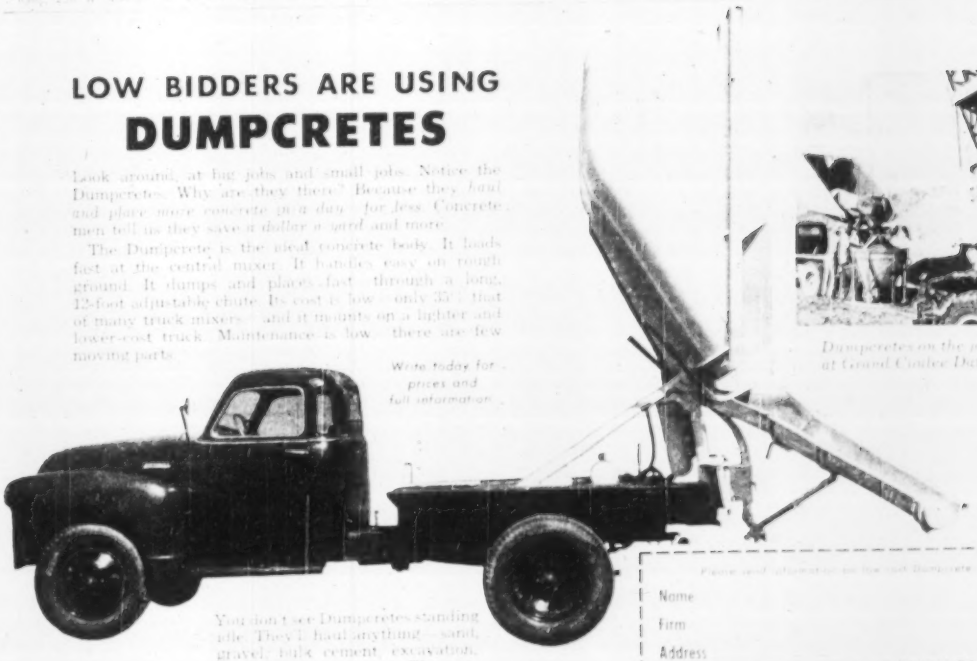
Dumpcretes on the job at Grand Coulee Dam.



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Name
Firm
Address

DUMPCRETE DIVISION
Maxon Construction Company, Inc.
527 Telsgit Building, Dayton 2, Ohio

The ONLY Culvert Metal Made of

For culvert sheets that will stand the abuses of installation and the rigors of exposure, you can't beat Continental KONIK. This open hearth culvert metal contains copper, nickel, chromium, and other elements that add strength and long life. KONIK, further protected by a heavy coating of zinc, is an ideal culvert metal that gives "carefree" service for years and years. See it at your distributor or write Continental at Kokomo, Indiana.

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DRILLING COMPANY
PITTSBURGH, PA.

INDUSTRIAL BUILDINGS

UNCLASSIFIED

CONSTRUCTION REPORTS-Second Section

WATER SUPPLY

BIDS ASKED

Fla., Sarasota ...

Mass., Worcester ...

Mo., Hayti ...

Tex., Arlington ...

LOW BIDDERS

Md., Baltimore ...

Mass., Red Wing ...

† N. M., Los Alamos ...

N. D., Tioga ...

Tex., College Station ...

Tex., Mercedes ...

† Washington ...

† Wash., Fort Lewis ...

Wash., Vancouver ...

CONTRACTS AWARDED

Fla., Miami Shores ...

Ill., Norridge ...

Ill., Sullivan ...

Md., Heatherville ...

Miss., Yazoo City ...

N. D., Fargo ...

O., Dayton ...

Tex., Dallas ...

SEWERS, WASTE DISPOSAL

BIDS ASKED

Conn., Hartford ...

N. J., Hammonton ...

Tex., Laredo ...

LOW BIDDERS

Calif., Los Angeles ...

Calif., San Diego ...

Calif., Santa Ana ...

Conn., Hartford ...

Ill., Chicago ...

La., Bossier Parish ...

Md., Trenton ...

New York ...

Tex., Dickinson ...

Tex., Galveston ...

Tex., Houston ...

Tex., Wake Village ...

Tex., Houston ...

CONTRACTS AWARDED

Ark., Gravette ...

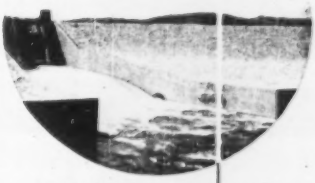
Calif., Santa Rosa ...

Ia., Fort Dodge ...

OVER the water...

The Mystic River Bridge, Boston, was paved with Darex AEA concrete to increase resistance of pavement to freezing, thawing, and de-icing salt action. *Photo courtesy of BOSTON HERALD*

In the Shadow Mountain Dam Spillway, near Grand Lake, Colo., Darex AEA concrete was used because of its increased workability, greater resistance to freezing and thawing. *Photo courtesy of Bureau of Reclamation.*



...UNDER the water

Darex *AEA* is a catalyzed air entraining agent, specifically formulated for making air entrained concrete. Darex AEA is being used in all types of concrete, all over the world.

Darex *AEA* is conveniently available in distributor warehouse stocks throughout North and South America and in most foreign countries.

Cement Products Division

Dewey and Almy Chemical Company

Cambridge 40, Massachusetts

Chicago 38 Montreal 32

DAREX T.M. REG. U.S. PAT. OFF.

Kan., Wichita ... City, City Hall ... (earthwork ... to W. B. Corporation ... 1224 Broadway. Approx. $56,000.

Minn., Long Prairie ... storm sewer improvements ... to J. & L. Excavating, Long Prairie, $55,806. ... bids rec'd.

O., Cleveland ... City, City Hall ... sewer ... Graybar ... Awarded ... $234,081. ... $225,000. ... Awarded ... J. C. ...

Ore., Roseburg ... City, City Hall ... sewer ... Engineer ... $138,388. ... and bridge ... Portland ... $141,085 ...

Tex., Pasadena ... Approx. $50,000 ... Approx. $58,600 ...

Alta., Calgary ... City, City Hall ... sewer ... $144,923 ...

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

June 26 — New Jersey
Connecticut — July 5
June 27 — British Columbia
Maryland — July 11
North Carolina — Oklahoma
June 29 — July 12
Indiana — Louisiana

Ill., Chicago ... B.A. ... Ave. ... Ave. Bridge ... Ave. ... Bridge ...

Ont., Cornwall ... Tay ... bridge ... bridge ... bridge ... bridge ...

LOW BIDDERS

California ...
... Channel ... Anderson ... Creek ... and ... Approx. $176,102 ...

▲ Calif., Los Angeles ... Ave. ... Approx. $1,110,000 ...

Iowa ... Lewis ... $96,807 ... $77,613 ... $57,271 ... $53,729 ... $100,775 ... $53,522 ...

Maine ... Bridge ... $65,135 ...

Maryland ... Ave. ... $236,[illegible] ... $100,[illegible] ...

Md., Baltimore ... Bridge ... June 2, 3 P.M. ... $64,400 ...

Minnesota ... Ave. ... Ave. ... $[illegible] ...

CONTRACTS AWARDED

Mo., St. Louis ... Ave. ... Ave. ... $624,794 ...

New Mexico ... bridge ...

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

June 26 — Pennsylvania
Connecticut — July 5
June 27 — California
Massachusetts — July 6
North Carolina — California
June 29 — Pennsylvania
Indiana — July 11
Kansas — Oklahoma
June 30 — July 12
Kansas — Louisiana

+ Me., Bangor ... B.A. ... Ave. ... Ave. ... Bridge ...

Minn., Austin ... B.A. ... Ave. ... Ave. ... Ave. ...

Pennsylvania ... B.A. ...

Louisiana ...

Mass., Stoneham ... B.A. ...

Minn., Wabasha ... B.A. ...

+ Ariz., Ajo ... Ave. ...

Tex., Galena Park ... Ave. ...

LOW BIDDERS

+ California ... Ave. ... $245,[illegible] ...

California ... Ave. ... $117,[illegible] ...

Calif., Sacramento ... Ave. ... $104,878. Fred Gurley ...

Colorado ... Ave. ... $52,[illegible] ...

Colorado ... $97,050. ... $44,[illegible] ...

Colorado ... $149,237 ...

† Colo., Denver ... Ave. ... $96,125. ... $10,000 ...

Fla., Miami ... $41,786 ...

Ill., Chicago ... Ave. ... $278,535 ...

▲ Ill., Chicago ... Ave. ... $697,65[illegible] ... $646,975 ... $727,5[illegible] ...

Kentucky ... $101,721 ... $120,644 ... $74,527 ... $42,038 ... $113,570 ... $3,467 ... $61,648 ... $56,129 ... $30,532 ... $108,[illegible] ... $48,802 ... $69,535 ...

Maine ... $129,[illegible] ... $280,755 ...

Md., Baltimore ... $52,404 ... $79,483 ...

Michigan ... $418,405 ...

Minn., St. Paul ... $109,[illegible] ...

Nebraska ... $344,111 ...

Nebraska ... $103,704 ...

New Hampshire ... 23 ...

CONTRACTS AWARDED

EARTHWORK, WATERWAYS

BIDS ASKED

LOW BIDDERS

CONTRACTS AWARDED

† Mississippi

† Pennsylvania

† Washington

† Wash. Milltown

▲† Wyoming and South Dakota

AIRPORTS

BIDS ASKED

LOW BIDDERS

† Tex. LaPorte

▲† Alaska

CONTRACTS AWARDED

PUBLIC BUILDINGS

BIDS ASKED

† Md.

▲ N. Y. Brooklyn

▲ Pa. Bethlehem

Ala. Fort Payne

LOW BIDDERS

Ala. Decatur

Calif. Bellflower

Calif. Elsinore

Calif. Los Angeles

Calif. San Jose

▲

▲†

La. Baton Rouge

Mass. Concord

N. C. Hertford

B. C. Prince Rupert

Kan. Hays

N. D. Grand Forks

Mass. Concord

Mass. Canton

Md. Salisbury

Mass. Westport

Mich. Charlotte

† Mo. St. Louis

▲† Mo. St. Louis

† N. M. Los Alamos

† N. M. Los Alamos

N. C. Durham

N. C. Rockingham

O. Avon Lake

O. Zanesville

† Pa. Pittsburgh

Va. Charlottesville

W. Va. Spencer

Wash. Raskin

CONTRACTS AWARDED

Ark. Elsinore

Calif. Avenal

Calif. Manhattan Beach

Fla. Panama City

Ia. Jefferson

COMMERCIAL BUILDINGS

BIDS ASKED

SOON LETS CONTRACT

LOW BIDDERS

CONTRACTS AWARDED

INDUSTRIAL BUILDINGS

BIDS ASKED

SOON LETS CONTRACT

Que., Three Rivers—(AA) Fire, E. C. Muller prop., Box Muller, pr., Montreal, soon lets contract 1 story, reinforced brick, block factory, concrete floors, for Canadian Wirebound Boxes, Ltd., Holy Cartland Ave. N., Montreal. Approx. $400,000. CD 4-21

LOW BIDDERS

N. C., Winston-Salem—(AA) Southern Bell Tel. & Tel. Co., 111 W. 2d St., Suite 2, Long Distance Bldg., New Bern Ave., Raleigh, S. C., let contract for 2 story, reinforced brick, addition to telephone exchange building, 200 N. Liberty St., Winston-Salem. $407,000. CD 5-24

Tenn., Chattanooga—(AA) Electric Power Board, 621 Power St., engineer, awards contract for 1 story, reinforced brick, addition to substation, 1801 Market St., to Martin Bros. Contracting Co., 1801 Market St., Chattanooga. Approx. $218,800. (Correction from Contracts Awarded, CD 6-22)

CONTRACTS AWARDED

Calif., Los Angeles—(AA) Air Force, Hdqrs. Air Research & Development Command, Andrews Air Force Base, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Myers Bros. Airport, Van Nuys, to Myers Bros. Airport, Van Nuys. $350,000

Conn., Stratford—(AA) U. S. Army Engineer District, New York, N. Y., awards contract for 1 story, reinforced concrete, addition to Army Aviation Support Facility, Main St., to Stratford Building Supply Co., Stratford. Approx. $75,000

Conn., Stamford—(AA) Housing Authority, Municipal Bldg., awards contract for 2 story, reinforced brick, 50 dwelling units, Fairfield Ave., to Dominic Construction Co., 1 Bank St., Stamford. Approx. $75,000. CD 5-24

Conn., Waterbury—(AA) Board of Education, 236 Grand St., awards contract for 1 story, reinforced brick, addition to Wilby High School, Wilby Ave., to Ferrucci Construction Co., 1 Bank St., Waterbury. Approx. $75,000. CD 5-24

Conn., Watertown—(AA) Board of Education, Main St., awards contract for 1 story, reinforced brick, addition to Watertown High School, Main St., to Ferrucci Construction Co., 1 Bank St., Waterbury. $68,000

Fla., Jacksonville—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Station, Atlantic Ave., to Gilbert Southern Corp., Gilbert Bldg., Savannah, Ga. Approx. $70,000. CD 5-24

Fla., Miami—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Station, Opa Locka, to Gilbert Southern Corp., Gilbert Bldg., Savannah, Ga. $75,000

Ill., Chicago—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Glenview, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. $160,000

Ill., Chicago—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Glenview, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. $75,000

Ill., Chicago—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Glenview, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. $75,000

Ill., Chicago—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Glenview, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. $68,000

Md., Baltimore—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Station, Middle River, to Walter A. Terrasa Co., 811 E. 40th St., Baltimore. $300,000

Minn., Minneapolis—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Minneapolis, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. $75,000

N. Y., Brooklyn—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Floyd Bennett Field, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. Approx. $145,000

N. Y., Brooklyn—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Floyd Bennett Field, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. Approx. $75,000

N. C., Harlington—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Station, to Walter A. Terrasa Co., 811 E. 40th St., Baltimore. $60,000

▲ Pa., Allentown—(AA) DAIRY PLANT, Lehigh Valley Cooperative Farmers, Inc., 1 Farmers Way, awards contract for 1 story, reinforced brick, 100 x 200 ft. dairy plant, Lehigh Valley Cooperative Farmers, Inc., 1 Farmers Way, Allentown. $1,000,000

Pa., Pittsburgh—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Greater Pittsburgh Airport, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. $145,000

S. C., Aiken—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Station, to Walter A. Terrasa Co., 811 E. 40th St., Baltimore. $100,000

Tex., Houston—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Houston, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. $115,000

Tex., Houston—(AA) Navy, Bureau of Yards & Docks, Washington, D. C., awards contract for 1 story, reinforced concrete, addition to Naval Air Reserve Training Unit, Houston, to Aetna Engineering Co., 1 N. LaSalle St., Chicago. $65,000

▲ Va., Roanoke—(AA) DAIRY PLANT, Lone Star Dairy, Inc., 432 Mad River Rd., awards contract for 1 story, reinforced brick, 100 x 200 ft. dairy plant, Lone Star Dairy, Inc., 432 Mad River Rd., Roanoke. $1,000,000

▲ Alta., Edmonton—(AA) PARKING GARAGE, Miller Motors, Ltd., 10 Ave. & 99 St., awards contract for 4 to 10 story, reinforced concrete, parking garage, 10 James C. Miller Bldg., 10 Ave. & 99 St., Edmonton. Approx. $6,000,000

▲ Alta., Edmonton—(AA) PARKING GARAGE, Miller Motors, Ltd., 10 Ave. & 99 St., awards contract for 4 to 10 story, reinforced concrete, parking garage, 10 James C. Miller Bldg., 10 Ave. & 99 St., Edmonton. Approx. $1,000,000. Alternate to above.

UNCLASSIFIED

BIDS ASKED

Nev., Milton—(AA) [illegible] Co., [illegible] Bldg., Las Vegas, Nev., [illegible] Approx. $6,000,000

† N. J., Beverly—(AA) [illegible] Co., [illegible] Bldg., Trenton, N. J., [illegible] Approx. $6,000,000

† N. Y., Canandaigua—(AA) [illegible] Co., [illegible] Bldg., Rochester, N. Y., [illegible] Approx. $6,000,000

† Tenn., Memphis—(AA) [illegible] Co., [illegible] Bldg., Nashville, Tenn., [illegible] Approx. $6,000,000

† Wis., Sheridan—(AA) [illegible] Co., [illegible] Bldg., Milwaukee, Wis., [illegible] Approx. $6,000,000

Conn., Danbury—(AA) [illegible] Co., [illegible] Bldg., Hartford, Conn., [illegible] Approx. $6,000,000

Conn., Wethersfield—(AA) [illegible] Co., [illegible] Bldg., Hartford, Conn., [illegible] Approx. $6,000,000

† Fla., Green Cove Springs—(AA) [illegible] Co., [illegible] Bldg., Jacksonville, Fla., [illegible] Approx. $6,000,000

† Mass., Lowell—(AA) [illegible] Co., [illegible] Bldg., Boston, Mass., [illegible] Approx. $6,000,000

† N. M., Las Cruces—(AA) [illegible] Co., [illegible] Bldg., Albuquerque, N. M., [illegible] Approx. $6,000,000

† Alaska, Anchorage—(AA) [illegible] Co., [illegible] Bldg., Seattle, Wash., [illegible] Approx. $6,000,000

Fla., Sanford—(AA) [illegible] Co., [illegible] Bldg., Jacksonville, Fla., [illegible] Approx. $6,000,000

SOON LETS CONTRACT

Idaho—(AA) [illegible] Co., [illegible] Bldg., Boise, Idaho, [illegible] Approx. $6,000,000

Texas—(AA) [illegible] Co., [illegible] Bldg., Dallas, Texas, [illegible] Approx. $6,000,000

LOW BIDDERS

Ala., Florence—(AA) [illegible] Co., [illegible] Bldg., Florence, Ala., [illegible] $815,853

Calif., San Francisco—(AA) [illegible] Co., [illegible] Bldg., San Francisco, Calif., [illegible] $101,470

Colo., Denver—(AA) [illegible] Co., [illegible] Bldg., Denver, Colo., [illegible] $64,512

Kan., Atchison—(AA) [illegible] Co., [illegible] Bldg., Kansas City, Kan., [illegible] $64,512

La., Metairie—(AA) [illegible] Co., [illegible] Bldg., New Orleans, La., [illegible] $244,000. CD 5-24

Md., Sandy Point—(AA) [illegible] Co., [illegible] Bldg., Baltimore, Md., [illegible] $879,700

† Montana—(AA) [illegible] Co., [illegible] Bldg., Helena, Mont., [illegible] $50,462

† North Dakota—(AA) [illegible] Co., [illegible] Bldg., Bismarck, N. D., [illegible] $822,260. CD 4-24

† Ore., Glendale—(AA) [illegible] Co., [illegible] Bldg., Portland, Ore., [illegible] $166,740

Pa., Harrisburg—(AA) [illegible] Co., [illegible] Bldg., Harrisburg, Pa., [illegible] $224,920

▲ Pa., Mechanicsburg—(AA) [illegible] Co., [illegible] Bldg., Harrisburg, Pa., [illegible] $1,358,147

Wash., Bellingham—(AA) [illegible] Co., [illegible] Bldg., Seattle, Wash., [illegible] $134,800

N. B., Sackville—(AA) [illegible] Co., [illegible] Bldg., Moncton, N. B., [illegible]

CONTRACTS AWARDED

Fla., Jacksonville—(AA) [illegible] Co., [illegible] Bldg., Jacksonville, Fla., [illegible] $143,000

Fla., Miami—(AA) [illegible] Co., [illegible] Bldg., Miami, Fla., [illegible] $60,000

Ill., Waukegan—(AA) [illegible] Co., [illegible] Bldg., Chicago, Ill., [illegible] $90,000

Kan., Kansas City—(AA) [illegible] Co., [illegible] Bldg., Kansas City, Kan., [illegible] $200,000

La., New Iberia—(AA) [illegible] Co., [illegible] Bldg., New Orleans, La., [illegible] $130,000

Nebraska—(AA) [illegible] Co., [illegible] Bldg., Omaha, Neb., [illegible] $600,000

† Oklahoma—(AA) [illegible] Co., [illegible] Bldg., Oklahoma City, Okla., [illegible] $570,961. CD 5-24

† Ore., Portland—(AA) [illegible] Co., [illegible] Bldg., Portland, Ore., [illegible] $158,740

Tenn., Knoxville—(AA) [illegible] Co., [illegible] Bldg., Knoxville, Tenn., [illegible] $50,000

Texas—(AA) [illegible] Co., [illegible] Bldg., Dallas, Texas, [illegible] $226,384

Que., Arvida—(AA) [illegible] Co., [illegible] Bldg., Montreal, Que., [illegible] $244,000

Proposal Advertisements (see pp. 99 & 100)

OFFICIAL PROPOSALS

U. S. Government

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS, Foot of Prytania Street, New Orleans, La., Sealed bids will be received in the office until 11:00 A.M., June 13, 1950, and then opened for the furnishing of superstructure of gated portion of Metairie Control Structure in the New Orleans District. The principal features of the work covered are approximately 1,000 tons of structural steel, 20,000 lb of reinforcing steel, and miscellaneous other work including sandblasting and painting of steel, and installation of 127 steel gates. Further information on application.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (specification No. 7823) will be received by Bureau of Reclamation, Yuma, Ariz., until 2:00 P.M., June 29, 1950, and then publicly opened for furnishing and delivering 1,000 tons of steel for the construction of Siphon Crossing of Main Canal, Gila Gravity Main Canal, Yuma Project, Wellton-Mohawk Division, Gila Project, Arizona. The work includes the fabrication and erection of steel trusses, bracing, and miscellaneous steel for the support of 24-in. steel pipe. Bidding data, specifications, and forms of proposal may be obtained from the Regional Director, Bureau of Reclamation, Box 427, Boulder City, Nev., or from the Project Manager, Bureau of Reclamation, Yuma, Ariz. Time allowed for completion will be 210 days. For particulars address Regional Director, Bureau of Reclamation, Boulder City, Nev., or Project Manager, Bureau of Reclamation, Yuma, Ariz.

MICHAEL W. STRAUS, Commissioner.

(7924)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (specification No. 7825) will be received by Bureau of Reclamation, Phoenix, Ariz., until 2:00 P.M., June 29, 1950, and then publicly opened for furnishing labor and materials for installing 1,000 tons of steel for the construction of Units T-12 and T-13 of Tucson Main Canal, Tucson Division, Pima Project, Arizona. The work includes the fabrication and erection of steel trusses, bracing, and miscellaneous steel for the support of 24-in. steel pipe. Bidding data, specifications, and forms of proposal may be obtained from the Regional Director, Bureau of Reclamation, Boulder City, Nev., or from the Project Manager, Bureau of Reclamation, Phoenix, Ariz. Time allowed for completion will be 120 days. For particulars address Regional Director, Bureau of Reclamation, Boulder City, Nev., or Project Manager, Bureau of Reclamation, Phoenix, Ariz.

MICHAEL W. STRAUS, Commissioner.

(7923)

OFFICIAL PROPOSALS

Elevated Steel Water Tank

Sealed bids will be received at the office of the Auditor until 2:00 P.M., July 11, 1950, for furnishing all labor, materials, and equipment for the erection of an elevated steel water tank and appurtenances, complete in place, for the Water Department of the City of Fort Lauderdale, Fla. The work includes the erection of a 1,000,000-gal capacity elevated steel tank on a 120-ft steel tower, and other work including sandblasting and painting of steel, and installation of 12" steel gates. Further information on application.

Each bid must be accompanied by a certified check or bid bond in the amount of 5% of the bid. The successful bidder will be required to furnish a performance bond in the amount of 100% of the contract price. The City reserves the right to reject any or all bids.

CITY OF FORT LAUDERDALE, FLA.
P. D. BAKKEN
City Manager

(7922)

OFFICIAL PROPOSALS

Furnishing and Delivering Copper Service Pipe

WASHINGTON SUBURBAN SANITARY COMMISSION

Sealed proposals for furnishing and delivering one hundred thousand feet (100,000 ft) of copper service pipe will be received by the Washington Suburban Sanitary Commission, 1017 Hamilton Street, Hyattsville, Maryland, until 11:00 A.M., Eastern Daylight Saving Time, Monday, June 26, 1950, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. B. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

By order of the Commission:
Walter Browning
Leland G. Worthington
Bids: June 26, 1950 (7927)

Furnishing and Delivering Curb Cock & Roadway Boxes

WASHINGTON SUBURBAN SANITARY COMMISSION

Sealed proposals for furnishing and delivering forty-two hundred (4200) curb cocks and two hundred (200) roadway boxes will be received by the Washington Suburban Sanitary Commission, 1017 Hamilton Street, Hyattsville, Maryland until 11:00 A.M., Eastern Daylight Saving Time, Monday, June 26, 1950, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. B. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

By order of the Commission:
Walter Browning
Leland G. Worthington
Bids: June 26, 1950 (7926)

Trunk Line Sewers

BETHLEHEM, PA.

Sealed bids will be received by the Bethlehem Authority at the office of the Authority, 10 East Church Street, Bethlehem, Pa., until 10:00 A.M., June 28, 1950, for the construction of trunk line sewers in the Saucon Valley area of Bethlehem Township, Northampton County, Pa. The work includes the construction of approximately 5,000 lin ft of 8-in. sewer, 1,000 lin ft of 10-in. sewer, 1,000 lin ft of 12-in. sewer, 1,000 lin ft of 15-in. sewer, 1,000 lin ft of 18-in. sewer, 1,000 lin ft of 21-in. sewer, 1,000 lin ft of 24-in. sewer, 1,000 lin ft of 27-in. sewer, 1,000 lin ft of 30-in. sewer, 1,000 lin ft of 36-in. sewer, 1,000 lin ft of 42-in. sewer, 1,000 lin ft of 48-in. sewer, 1,000 lin ft of 54-in. sewer, 1,000 lin ft of 60-in. sewer, 1,000 lin ft of

OFFICIAL PROPOSALS
(Continued from page 93)

Bids: July 6 and July 7, 1950 (822)

Sewage Disposal System and Sewer Improvements

City of Tampa, Florida

Proposals are invited by the City of Tampa, Florida for construction of portions of the Sewage Disposal System and Sewer Improvements and will be received in the regular meeting place of the Board of Representatives until the following times:

Intercepting Sewers and Force Mains, 10 A.M. EST, July 5, 1950. Pumping Stations and Ejector Stations, 10 A.M. EST, July 7, 1950. Sewer Improvements, 2 P.M. EST, July 7, 1950.

Plans and contract documents may be examined and obtained at the office of the Superintendent of the Department of Public Work, City Hall, Tampa, Florida and at the office of Greeley and Hansen, Engineers, 229 South State Street, Chicago, Illinois. A deposit of $25.00 is required for contract documents for each of the three sections.

City of Tampa, Florida
By Curtis Hixon, Mayor

Dated June 8, 1950

Bids: July 6, 1950 (838)

Highway Work

Broome County Highway Department
Binghamton, New York

Bids are to be received by the County Superintendent of Highways at the Broome County Highway Office, County Office Building, Binghamton, New York until eleven o'clock Eastern Day Light Saving Time on Thursday, July 6th, 1950 for the construction of the following:

Chenango Center New, Federal County Road No. 30 and No. 2 Project No. 236-A, Broome County, New York, Length 2.5 miles. Surface treatment. Estimated cost $11,000. Application was made per letter for above work shall be as follows: Labor, $1.40 per hour.

Maps, plans, specifications, estimate and proposal forms may be seen at the office of the County Superintendent of Highways at Binghamton, New York. Copies of plans and proposal forms may be obtained upon deposit of $5.00 for each set. Deposits will be returned to the Broome County Highway Department.

Special attention of bidders is called to the general information for bidders, to the special specifications and contract agreement. Contract proposals must be submitted in a sealed envelope with the name and number of the project plainly endorsed thereon and addressed to the County Treasurer, Broome County Office Building, Binghamton, New York. Each proposal must be accompanied by a certified check payable to the County Treasurer of Broome County, New York, in the amount of five per cent of the total amount of the bid. Each bidder will be required to file with the County Treasurer a bond with sufficient sureties in the penal sum of one hundred per cent of the amount of the bid, conditioned upon the faithful performance of the contract. The successful bidder will be required to furnish a performance bond in the penal sum of one hundred per cent of the amount of the contract. Each proposal must be accompanied by a statement of the bidder's experience in the construction of highways, and a statement of his financial ability to perform the work contemplated by the contract. Each proposal must be accompanied by a statement of the bidder's equipment available for the work contemplated by the contract.

The right is reserved to reject any or all bids and to waive any informalities in or to reject any or all bids.

Each bidder must be registered for the work with the Industrial Board of the Department of Labor of the State of New York at the time of the opening of bids.

Payment will be made on the basis of monthly estimates of the work performed, as shown by the records of the Engineer, and approved by the County Superintendent of Highways and the Commissioner of Public Works. Ten per cent of each estimate will be retained until the completion and acceptance of the entire contract.

Attention is called to the fact that not less than the prevailing rate of wages as determined by the Industrial Commissioner of the State of New York must be paid on this project.

Each proposal must contain the name and residence of the person making the same; the names of all persons interested therein, and if no other person be so interested it shall distinctly state the fact; that it is made without any connection with any other person making a bid for the same purpose, and that it is in all respects fair and in good faith, without collusion or fraud.

The successful bidder will be required to comply with the provisions of Section 220 of the Labor Law of the State of New York.

Dated June 15, 1950

Broome County Highway Department
Binghamton, New York

Construction of Structures, Grading, Drainage and Paving

OFFICIAL PROPOSALS

State Line, at a point approximately 5,360 feet West of Township Road 306 in North Beaver Township at Turnpike Station 6+98.66 Lawrence County, thence in an Easterly direction 22,401.47 feet to a point approximately 220 feet West of Legislative Route 37004 in Little Beaver Township at Turnpike Station 231+00, Lawrence County, a distance of approximately 4.24 miles.

The approximate quantities of the principal items are as follows:

Class 1 Excavation, 247,586 cubic yards; Class 2 Excavation, 19,186 cubic yards; Borrow Excavation, 209,662 cubic yards; Reinforced Concrete Pavement, 126,644 square yards; Class A Concrete, 2,172 cubic yards; Class B Concrete, 3,196 cubic yards; Steel Reinforcing Bars, 142,791 pounds; Fabricated Structural Steel, 256,200 pounds.

Copies of plans, specifications and other contract documents, including cross sections are on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission, located at Harrisburg, Pennsylvania, on June 22, 1950. Plans, specifications, cross sections and other contract documents will not be available before this date for inspection or for mailing to prospective bidders. Copies of specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission at the rate of five ($5.00) dollars per copy. Copies of cross sections must be purchased from the Pennsylvania Turnpike Commission for the sum of fifty ($50.00) dollars per set.

Plans and contract documents for the entire extension of construction and specifications may be obtained from the Commission upon deposit of ten ($10.00) dollars for each set, such deposits to be refunded in full to non-successful bidders upon the return of the plans in good condition within ten days after the opening of the bids. Refund will be made for all plans, contract documents and specifications returned at the opening of the bids. Refund will be made for all plans returned at the opening of the bids. Refund will be made for all plans, contract documents and specifications

PUMP DESIGNER

Centrifugal, Axial Flow and Deep Well Turbine Pump Manufacturer has position available for experienced pump designer with thorough knowledge of hydraulics. Mid-western location. Submit full particulars first reply, please. Replies will be held in strict confidence.

P-6948, Engineering News-Record
330 West 42nd St., New York 18, N. Y.

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P-6206, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Needed: Several First Class experienced detailers and checkers. Only those with previous structural fabricating shop experience need apply. Give complete information to Personnel Dept.

Consolidated Western Steel Corp.
Orange, Texas

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P-6919, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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P-6889, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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AVAILABLE

National Chain Link Fence Manufacturer has agency opening. Experienced fence man preferred.

BW-6895, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

POSITIONS VACANT

SELLING OPPORTUNITY OFFERED

Continued on the opposite page

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or

Planning Engineer II

CIVIL ENGINEER

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P-6918, Engineering News-Record
520 North Michigan Ave., Chicago 11, Ill.

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(Continued from opposite page)

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Universal truck crane.

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Lorain 75B 77 1½ yd shovel attachment rebuilt.
Chain crowd L41 shovel attachment.
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Chain crowd Lorain 30A shovel attachment.
Lorain 40 Hi-Lift shovel attachment.
Bucyrus Erie 30B tunnel front attachment.
Koehring 301 dragline fairlead.
50' crane clam boom, 1¼ or 1½ yd.

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¾ yd Lorain, 40" LBS 6105, 44" cutting width, teeth, sheave.
27" outside width drop bottom type LBS ±1033, good condition.
26" outside width solid bottom type LBS ±4077, good condition.
¾ yd Amsco 40" cutting width, LBS ±8101.
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NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2 yd crane.
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Lorain 41, ¾ yd, LBS ±7413, new condition.
New Lima 1 yd, Amsco, LBS ±2295.
Bucyrus Erie 1¼ yd gas air, LBS ±3782, fair.
Lorain 75 manganese 1¼ yd, LBS ±7233, teeth and bail.
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Pettibone Mulliken 2 yd Lorain 82 or 820, manganese, LBS ±5361.
Pettibone Mulliken 2 yd for 3500 Manitowac LBS ±5763.

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Ingersoll Rand 105 cubic foot, Waukesha gasoline power, on two rubber tires.
Gardner Denver 105 cubic foot with air receiver, hose reel, driven by power take-off and mounted on 1941 Ford.
Gardner Denver air cooled 105 cubic foot with air receiver, V belt drive from power take-off and mounted on 1942 Ford chassis with Wood two yard dump body.
LeRoi 2 stage 105 cubic foot air cooled skid mounted, built-in tool boxes, hose reels and hose.
Gardner Denver two stage 160 cubic foot skid mounted.
Schramm 210 cubic foot with International UD14 diesel on steel wheels.
Worthington 210 cubic foot two stage, air cooled, on steel wheels with Hercules diesel.
Gardner Denver 315 cubic foot two stage skid mounted, Murphy four cylinder diesel.
Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven 50 HP slip ring motor.
New Gardner Denver 500 cubic foot two stage water cooled, D13000 Caterpillar diesel on 4 pneumatics. Used 2 months.
Worthington, two stage, water cooled, vertical 250± 60 CFM, new condition.

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Cedarapids BBB 1036 Scalper.
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New 16 x 16 double clamshell gates.
20" x 6.6" Belt Type Magnetic Separator.
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1½ ton Ford & Chevrolet.
2½ ton GMC. New and rebuilt.
Sterling COE Model 255GCS tandem drive tractor, 9.00x24 tires, 200 HP Cummins supercharged diesel, complete with 40 ton Rogers low bed equipment trailer, 16 - 7.50x20 tires, airbrakes, outriggers, excellent condition.
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27E Koehring Paver.
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Heltzel 10-12' finisher, rebuilt.
Blaw-Knox gas-electric 10½-12½', rebuilt.
2 Koehring 10-12', rebuilt.

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Blaw-Knox type SA 10-15' spreader. New condition.

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#30 Truscon 7' x8" forms, with stakes.
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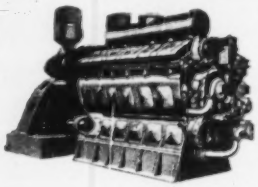

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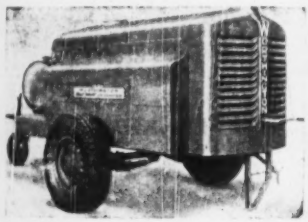

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1—Schramm Diesel 315 cu. ft. 2 stage comp. 1942.
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800 gal. auxiliary water tank

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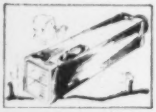

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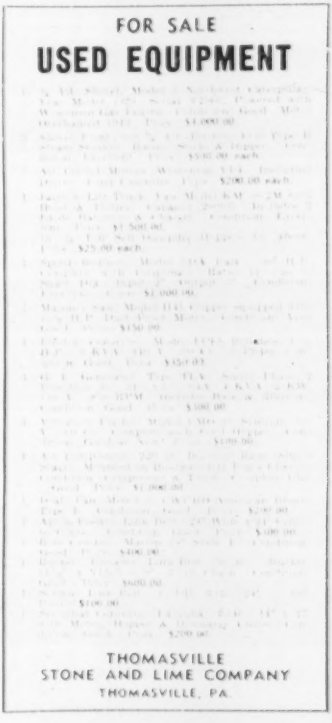

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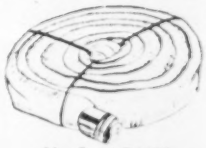

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FIRE HOSE
2½ in. x 50 ft.

Rubber lined, dbl. cot. ton jacketed, male and female couplings. Nat'l Standard fire hose thread.
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Lots of 10 pcs. $17.50
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Factory new Barnes Centrifugal Pumps
Sizes 2" to 6"
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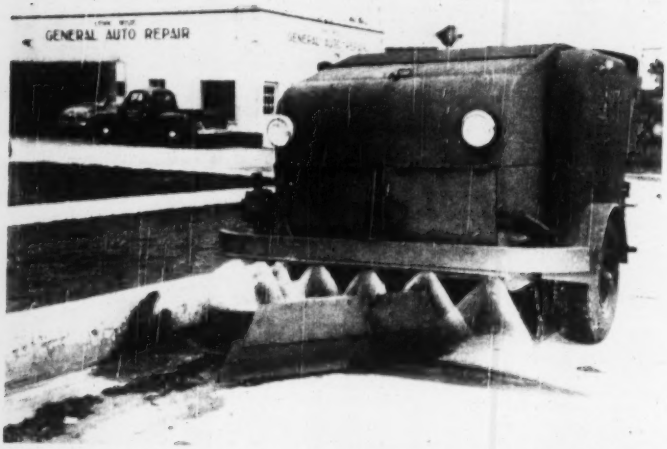
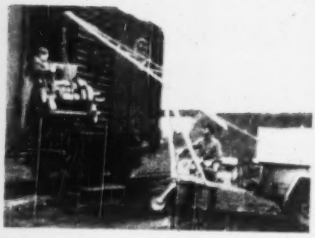
NEW PRODUCTS

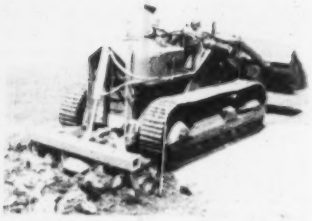


Combination Sweeper and Truck Carries Its Load to Dumping Area

COMBINATION STREET SWEEPER AND truck sweeps dirt and debris from city streets and carries the load to a dumping area eliminating a follow-up crew. Hopper capacity is 5½ cu. yd. Unit has a cutter bar mounted at the front which sweeps debris from curb and into path of the side broom. Flexible gutter broom picks up broken glass and other sharp objects. Two speed conveyor which moves dirt from street into hopper, is capable of loading hopper at rate of 1,555 cubic feet per min. It operates independently of forward motion of the machine. Single rear wheel steer provides high maneuverability. Power is provided by a 110 hp Ford engine. Traveling speed is fixed at 25 mph. The machine is made in single and dual gutter broom models with dual controls. WAYNE MFG. CO., POMONA, CALIF.



Self-Contained Crane



Heavy-Duty Ripper

Concrete Testing Machine

Air Conditioners

Portable Materials Elevator

Continued on page 115

When the old stack failed at the Pittsfield, Mass., plant of A. H. Rice Company, the owners looked for a replacement that would give longer service with less repair and maintenance. They settled on Byers Wrought Iron. The towering new stack shown in the illustration was erected by William Allen Sons Co.

The soundness of this choice is confirmed by the reported experience of many engineering users. One company, for instance, had a composite stack—bottom wrought iron, and the top 30-ft. section low-first-cost material. In the first 28 years of operation, the top section was replaced three times. Wrought iron was then used for replacement, and—with the original wrought iron bottom—was still serving 20 years later when the stack was no longer needed. Its condition was so good that it was sold and re-used by an industrial school.

In another instance, the top of a wrought iron stack was replaced after 30 years' service. Low-first-cost material was used. After only *five* years under the conditions that wrought iron has withstood for 30, this new top section failed.

With today's high maintenance costs, it is just plain good business to assure that every metal stack lasts as long as possible, with as little attention as possible. The importance of this move increases as stacks grow taller, for the higher the stack—the higher the cost of maintenance.

Some degree of corrosion is encountered in every unlined metal stack. The CO_2 present in all flue gases, when dissolved in any condensed moisture, forms a dilute acid that is highly destructive to vulnerable materials. Most fuels also contain some sulfur compounds, which aggravate the condition. Changes in fuels, intermittent operation, or stack heights that permit the cooling of the gases below the dew point, may increase the severity of attack at any time.

Wrought iron has a unique structure that arms it against this threat. The tiny fibers of glass-like silicate slag that are threaded through the body of high-purity iron are immune to corrosion, and halt and disperse any attack. This discourages the pitting and rapid penetration that causes ordinary materials to fail. The fibers also anchor the initial protective film, which shields the underlying metal.

Repairs come high in stacks like this... so they replaced with BYERS WROUGHT IRON

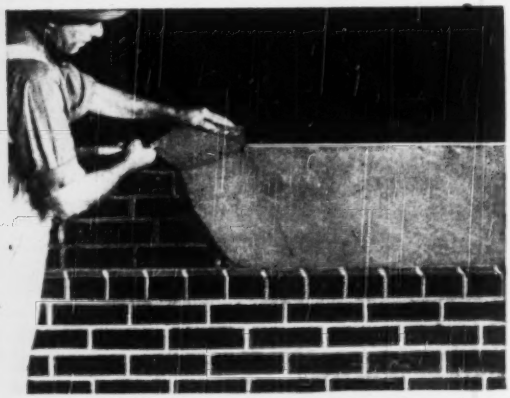
You will find some helpful information on the general problem, and some facts on successful solutions, in our bulletin WROUGHT IRON FOR FLUE GAS CONDUCTORS AND COAL HANDLING EQUIPMENT. We will be very glad to send you a copy, on request.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, Salt Lake City, San Francisco. Export Division: New York, N. Y.

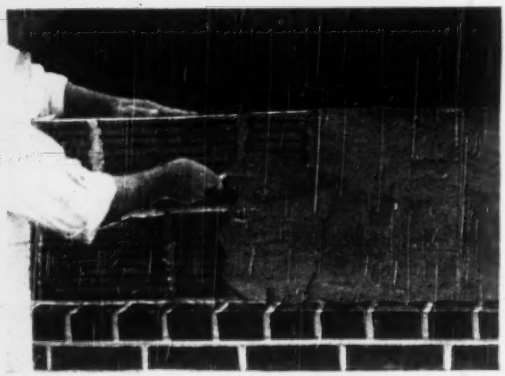
CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

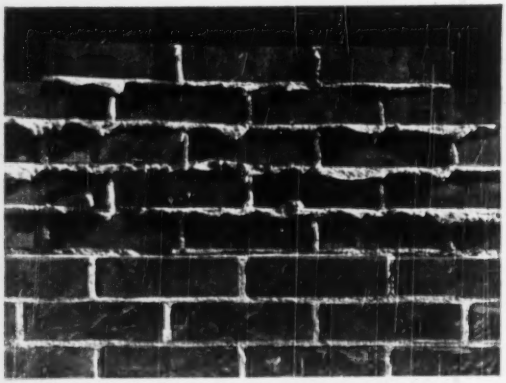
GOOD BRICKWORK = GOOD DESIGN + GOOD WORKMANSHIP + GOOD MATERIALS



The face brick should be backplastered.



If the back-up units are laid first, the front of the back-up units should be plastered.



Backplastering should not be attempted over protruding mortar joints.

PARGING

WITH

BRIXMENT

HELPS ASSURE

DRY WALLS

WE SUGGEST THAT—

The face brick should be backplastered with not less than ⅛ of an inch of mortar before the back-up units are laid.

Or, if the back-up units are laid first, the front of the back-up units should be plastered with not less than ⅛ of an inch of mortar before the face brick are laid.

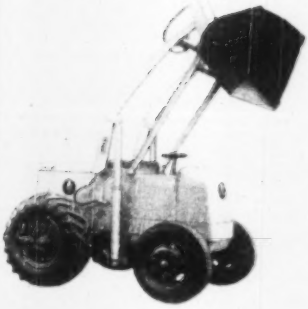
Heavy rains don't make brick walls leak — they merely reveal the fact that the walls contain voids or passages through which the water may penetrate.

Dry brick walls are primarily the result of good design and good workmanship. Good materials are important, but still secondary. The more *plastic* the mortar used, the easier it is for the bricklayer to deliver good workmanship.

The photos at the left show some points of *good workmanship.*

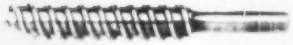
Brixment mortar has greater plasticity, higher water-retaining capacity and better bonding quality. Because of this *combination* of advantages, architects, contractors and dealers all over America have for thirty years made Brixment the largest-selling mortar material on the market. Why not try it yourself?

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY



Re-Styled Tractor Shovel

Improved Model HL Euclid tractor shovel has a rated capacity of 2½ cu. Improvements include: Greater engine horsepower, greater inch-at-a-tractor effort, more digging power, faster speed range (up to 19.5 mph), increased stability and balance. Beam sub-guards are standard equipment.—The Frank G. Hough Co., 852 Sunnyside Ave., Libertyville, Ill.



Rotary Masonry Drill

Carbide-tipped rotary drill bit features two spiral flutes for removing dust and to provide maximum body strength near the drill. Advantages claimed for the Cyclo Tex drills are: No grinding of bits, no cooling or flooding down of drilling to avoid dust as it is drilled, minimum drilling rate and lower temperature result in carbide tipped longer lasting. These drills are available in sizes from ⅜ to 1 in.—New England Carbide Tool Co., Inc., 60 Brookline St., Cambridge 39, Mass.

Soil Sampling Kit

Hand-operated soil sampling kit contains equipment for obtaining accurate, dependable subsurface information. The twelve tools included can be used to obtain samples to depths of 25 ft in practically all soil and earth formations. The kit, which can be carried in a steel carrying case, can be carried on an automobile. Standard items include: Posthole digger, auger, sampling tube and hammer, sampling tube and hammer, cutting bits, casing, and accessories.—Continued on p 120

Street Repairs Cost Less

...with 80-lb. Le Roi CLEVELAND model 52 Breakers because:

★ They hit harder — do more work
★ They are easier to hold — your men like them
★ They require less maintenance — you save money

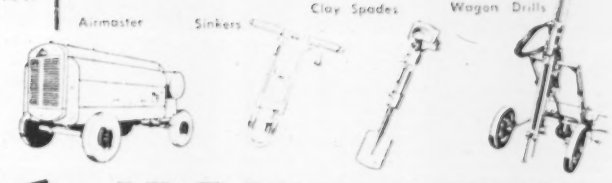
Now that winter has gone, frost-damaged streets will need plenty of repairs. You can keep these costs to a minimum by using Le Roi CLEVELAND 52 Paving Breakers. These features tell you why:

★ *Low air consumption* — the 52's exclusive valve meters the air so effectively that you can run it off any 60-foot compressor — two from 105-foot compressor.

★ *Plenty of punch* — takes any breaker job from asphalt to the toughest concrete in its stride and does it faster and easier.

★ *Positive shank oiling* — chuck bushings last longer and the whole machine receives adequate lubrication for longer life.

Now is the time to get set for lower paving breaker costs. Order 52's from your nearby Le Roi distributor. Write us for literature giving full design details.



LE ROI COMPANY
CLEVELAND DIVISION • Manufacturers of CLEVELAND ROCK DRILLS
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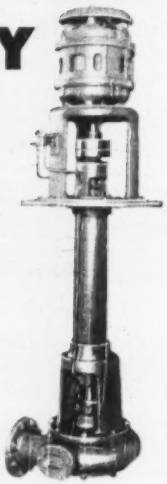
LIFT A TRUCKLOAD

of unscreened sewage or drainage ...every 20 seconds with

ONE ECONOMY SUMP PUMP



Up to 10,000 gallons of raw domestic and industrial sewage or drainage can be lifted by one of these Economy Sump Pumps every minute!

From this giant down to the smallest basement drainage unit, each Economy Sump Pump is engineered for low-cost, trouble-free performance.

Impellers are non-clogging and will pass unscreened sewage with high efficiency. Eliminating screens and the usual screen-cleaning shutdowns, these pumps are economical in operation . . . use no more power than the ordinary strainer type ejector. Installation is simple and inexpensive.

For full details on design advantages and patented features, write Dept CB-6 for Bulletin No. E345.

Centrifugal, Axial, and Mixed Flow Pumps for all applications.

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CORE BORINGS for Foundations, Dams, Bridges and all Heavy Structures
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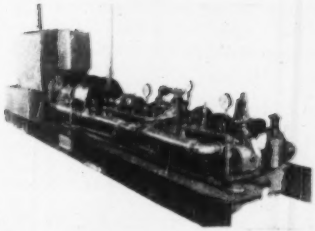
auger; Jamaica auger and ship auger for sticky, cohesive materials; split-tube sampler and Chicago thin-wall tube for obtaining undisturbed samples; sample jars; and necessary drill rods and fittings. ACME DRILL CO., INC., 725 W. LACKAWANNA AVE., SCRANTON, PA.



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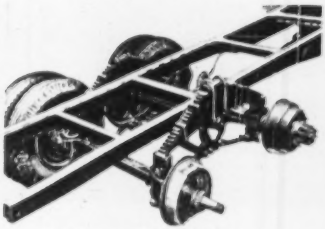
Portable units are designed for making asphalt emulsions on the job, or at central stationary installations. Production capacities range from 500 to 6,000 gph of emulsion. Plants are supplied complete with emulsion mill, asphalt- and water-proportioning units, water-treating unit, supply and discharge pumps, asphalt-heated storage tanks, and diesel, gasoline, electric, or belt drive. Units can be supplied on tired trailer mountings, skid types for use on motor trucks, and as permanent installations. K. E. MCCONNAUGHAY, PAINTERS & DECORATORS BLDG., LAFAYETTE, IND.



Trailing Axles for Trucks

Doubled load capacity on 11 to 5-ton trucks is possible through use of the Little Giant trailing axles. Designed for use with 2-axle trucks, these units are installed as a third axle and wheels directly behind the rear driving axle. Installation of the MODEL B, which is rated at 15,000 lb capacity, calls for 2 pairs of 9-in. channels, 4 axle plates, 16 axle clamps, 16 spring clips, 4 spring plates, 4 spring shackles, 4 spring bolts, 4 shackle bolts, 4 axle bolts, 4 spring pads, 4 spring pad bolts, 4 spring plate bolts, 4 spring clip bolts, 4 axle plate bolts, 4 axle clamp bolts, 4 spring

GULF PRODUCTS and FINE SERVICE

keep equipment rolling

on P. R. R. relocation project

The famous 100-year old tunnel on the Panhandle Division of the Pennsylvania Railroad near Dennison, Ohio will soon be abandoned in favor of a tremendous cut nearly two miles long through the hills of Harrison County. Hunkin-Conkey Construction Company, Cleveland, Ohio have the contract for this huge project, which involves moving 2,500,000 cubic yards of earth and rock.

ALL-WEATHER protection with Gulf lubricants and smooth power with Gulf fuels have played a big part in our fast progress on this big earth moving job," says D. R. Bartle, Job Superintendent. "We asked for quality petroleum products, and that's exactly what we are getting—keep them coming!"

Like so many other leading contractors, Hunkin-Conkey Construction Company has found that it's good *profit insurance* to use Gulf lubricants and fuels. Gulf lubricants provide an extra margin of protection against mechanical delays—and Gulf fuels help insure better engine performance!

Write, wire, or phone today and arrange to use Gulf quality products on your next job. They are quickly available to you through 1,200 conveniently located warehouses.

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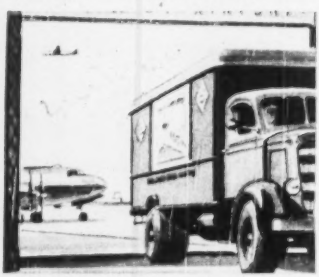
How to meet a payroll (at a cost of $3.19)

Twenty-four hours before factory payday, another check-writing machine was needed *fast*. At 10 A.M. plant manager ordered one from supplier 100 miles away. He specified Air Express, the service regularly used to keep production rolling. 26-lb. carton delivered same day at 2 P.M.—in time! Shipping cost only $3.19!

$3.19 was total cost—and *included* door-to-door service! Air Express is the most convenient way for you to ship or receive—in addition to being the world's fastest transportation method.



You get round-the-clock service with Air Express. Shipments go on all flights of the Scheduled Airlines. Air Express is service you can *count on* to keep your business rolling in high gear.

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Rates include pick-up and delivery door to door in all principal towns and cities

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New Product Briefs

Steam turbine. Model TT-5 delivers 5 hp at 2,000 to 5,000 rpm. A larger model, TT-15, is rated 15 hp at 5,000 rpm. The Little Giant turbines may be mounted vertically or horizontally. Maker: Moon Mfg. Co., Chicago 11, Ill.

Self-dispensing rope-coil container keeps rope clean at all times and serves as a handy storage unit for unreeling portions of the coil. The rope is pre-measured and marked in red at 10-ft intervals. Maker: New Bedford Cordage Co., New Bedford, Mass.

Electric blasting caps are protected by a plastic shunt. By covering both ends of each wire, the shunt minimizes possible corrosion due to atmospheric conditions. Maker: Olin Industries, Inc., East Alton, Ill.

Two new acoustical materials are Natural-beveled Fiberglas textured acoustical tile, and natural-beveled Fiberglas perforated acoustical tile. Easy to clean and maintain, these tiles have noise reduction coefficients ranging up to .85. Maker: Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

Power-actuated tool features new automatic firing pin action, where speed and force of forward motion are not important. Spring-loaded safety arm in handle keeps tool from being actuated. Used in shop and field, fastener strips can be used. Maker: Mine Safety Appliances Co., Pittsburgh, Pa.

Measuring system electronically records pressures at distances of 50 miles from the point of measurement. Typical applications: determination of levels of materials loaded into distant storage tanks. Maker: Manning, Maxwell & Moore, Inc., and Bourns Laboratories, Inc., Manufacturers Gas Regulator Co.

Metal abrasive cut-off machine cuts with nuller kerf-much to tolerance of .005 in. Handles all types of metal, ceramics, ... Manufacturer: Cleveland Metal Abrasive Co., Mineola, N.Y.

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MONEY-SAVER FASTENERS Pay Dividends

LAMSON LOCK NUTS: Economical, vibration-proof. Can be re-used repeatedly.

"1035" SET SCREWS: Cup point type, hardened, heat-treated.

COTTER PINS: Steel, Brass, Aluminum and Stainless Steel.

"1035" CAP SCREWS: Hi Tensile heat-treated steel.

TRACTOR BOLTS: Made to manufacturers' standards.

MILLED STUDS: Concentric, accurate, in a full range of sizes.

"BENT" BOLTS: Including U Bolts, Eye Bolts, Hook Bolts, etc.

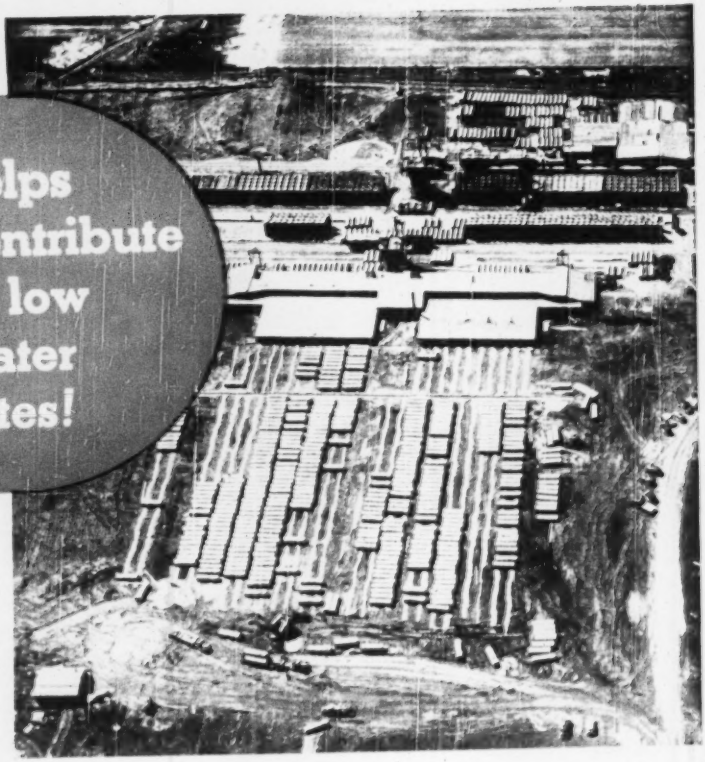
Wire Rope Clips: Hi-Carbon saddles, extra-strength U Bolts.

PIPE PLUGS: Forged Steel, heat-treated.

FOR MORE INFORMATION ON LAMSON Money-Saver FASTENERS . . . . . CHECK COUPON and CLIP THIS STRIP

The Lamson & Sessions Company
1971 W. 85th St., Cleveland 2, Ohio

LOCK JOINT PIPE helps contribute to low water rates!



A temporary Lock Joint pipe plant at the site. Use of local labor and materials returns to the community a large part of the pipeline cost.

Although a modern water supply system represents a sizeable investment, sound engineering makes it possible to keep water rates at a minimum.

Knowing this, economy minded water supply engineers specify Lock Joint Reinforced Concrete Pressure Pipe for mains of 16" or larger. Lock Joint's low initial cost, its long life, its exceptionally high carrying capacity and its negligible maintenance cost assure the utmost service for the consumer's dollar.

Water works officials who have installed Lock Joint pipe lines point to these lines as the most economical in their entire systems.

We shall be glad to discuss your requirements. Simply write or call our nearest office.

Lock Joint's easy installation means low laying cost.

LOCK JOINT PIPE COMPANY

Est. 1905

P.O. Box 269, East Orange, N. J.

PRESSURE PIPE PLANTS: Wharton, N. J. • Turner, Kan. • Detroit, Mich.

BRANCH OFFICES: Cheyenne, Wyo. • Denver, Colo. • Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. • Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn.

SCOPE OF SERVICES: Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

Manufacturers' Publications

Earth-Boring Machine—Features of operation of the Sterling hydraulically controlled earth-boring machine are described in this 8-p. catalog. The catalog describes operation of the unit, lists salient design features, and contains case histories of jobs on which the machine has been used.—Sterling Engineering & Mfg. Co., Wilkes-Barre, Pa.

Plywood—Many new woods and grades of plywood are listed in the 1950 Weldwood catalog. Profusely illustrated, the catalog lists 66 of the company's products.—United States Plywood Corp., 55 W. 44th St., New York 18, N. Y.

Waste Water Treatment—Technical supplements contain practical information on modern waste and water-treatment methods and equipment. Two recent editions are: Technical Supplement CR describing grit removal in sewage treatment by means of the Camp grit chambers. Technical Supplement IV describes a telescoping sludge control valve for positive and visual control of sludge withdrawal.—The American Well Works, Aurora, Ill.

Glass-Block Installation—Illustrated description of how to install glass-block panels makes up this 4-color folder. The bulletin tells how to install small panels without wall ties, expansion joints, wall anchors, or caulking (except at head). Details are provided for installation in wood frame or brick veneer frame.—American Structural Products Co., Subs. of Owens-Illinois Glass Co., Toledo 1, Ohio.

Gas Unit Heaters—Series C Pittsburgh gas unit heaters are illustrated and described in a 4-page folder. These heaters feature cast iron heat exchangers. Specifications included for six units ranging from 85,000 to 255,000 Btu per hr.—Automatic Gas Equipment Co., 501 Brighton Ave., Pittsburgh 21, Pa.

Caterpillar Catalogs—Five new catalogs are available from Caterpillar. Catalog 12597 (56 pp.) contains information on the complete line of Caterpillar equipment including several new machines which have been added recently. Form 12857 is a booklet describing the Model 40 scraper. Form

(Continued on page 121)

THE 1950 JACKSON HYDRAULIC OFFERS

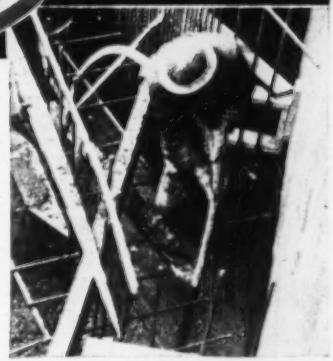
Greater Time and Labor Savings, Greater Efficiency and Reliability Than Has Ever Before Been Provided In Any Concrete Vibrator for General Construction

Reaches Every Point in a 100' Circle!

Its 50' hose eliminates many changes of location, saves time and makes the hard-to-reach places easily accessible.

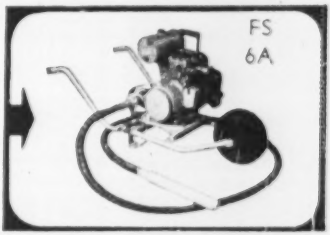
7 HP ENGINE — Loads of power for continuous operation, day in and day out. 4,000 to 7,000 VPM (instantly variable) with frequency and amplitude carefully balanced to give perfect compaction under all conditions. 2¼" vibrator head.

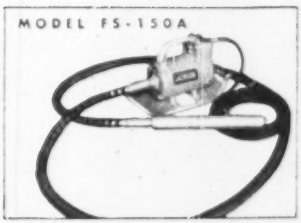
NO DAILY MAINTENANCE. All vibrator parts operate in stream of oil *under pressure!* QUICKLY CONVERTED TO WET OR DRY GRINDING. This machine will save its cost in short order.



FLEXIBLE-SHAFT VIBRATOR

Model FS-6A is the finest of the engine-driven, flexible-shaft type vibrators. Ample power (4 HP). Available with 3 heads for thick or thin sections. Shafting furnished in 7' to 14' lengths, up to 28'. Grinding and other attachments. An excellent performer as proven on thousands of jobs.





FLEXIBLE-SHAFT, ELECTRIC VIBRATOR

2½ HP motor. Plenty of power to handle the stiffest mixes with the maximum length of shaft (28'). Operates from light socket, 115 volt, single phase AC or DC. 8,000 to 10,000 VPM. Available with 3 vibrator heads and any length of shaft up to 28'; attachments for quick conversion to wet or dry concrete rubbing. Highly convenient, weighs only 59 lbs.

IDEAL VIBRATORS FOR EVERY TYPE OF JOB:
thin sections to mass construction — Highway, airport and municipal paving. Soil compaction. Portable Power Plants.

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Get your free copy of the Jackson "POCKET GUIDE", describing this equipment.

ELECTRIC TAMPER & EQUIPMENT CO. • Ludington, Michigan

FRUEHAUF BULK CEMENT TRAILERS

FOR BULK HAULS

OF ANY POWDERED OR PULVERIZED MATERIAL—
90 TO 130 BARRELS PER LOAD

THIS Fruehauf Bulk Cement Trailer fits the requirements of a specialized hauling problem—yet it is not a "specially" built unit with a premium price tag. It's a standard Trailer in the Fruehauf line, with such outstanding features as Fruehauf's exclusive Gravity-Tandem Suspension or "Multi-Rate" single-axle Suspension with 2-speed Vertical Supports—features that make Fruehauf Trailers the world's best!

The discharging mechanism is powered by a 21 H.P. gas engine. It is located under the tank in an enclosed compartment mounted well forward to prevent the entrance of harmful dust. Self-lubricating twin screws convey the load to the rear—dump anything up to 1 inch in diameter at 5 barrels per minute. Screws may be operated singly or together. Triple control levers allow operation from engine compartment, or from either side of the rear of the Trailer. 2 baffles (within the tank) prevent load shifts. Manholes on the tank top, located ten feet apart, provide fast, easy loading. Curbside ladder allows easy access to manholes.

For complete information and specifications on the Fruehauf Bulk Cement Trailer, write—

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY

DETROIT 32 • LOS ANGELES 58

In Canada: Weston, Ont.

FRUEHAUF Trailers
"ENGINEERED TRANSPORTATION"

FIRST IN TRUCK-TRAILER TRANSPORT!

12682 is a descriptive catalog covering the use of diesel tractors. Form 12679 is a descriptive catalog explaining the use of Caterpillar engines on construction jobs. Form 12809 is a booklet describing irrigating, dredging, waterworks, sprinkling, and water-supply pumps driven by diesel engines.—CATERPILLAR TRACTOR CO., Peoria 8, Ill.

Precision Lathes. South Bend's Light Ten lathes are illustrated and described in Catalog LT10. Complete specifications and prices are listed, as are attachments and accessories for use with the lathes.—SOUTH BEND LATHE WORKS, 425 E. Madison St., South Bend 22, Ind.

All-Glued Laminated Rafters. Catalog tables all types and sizes of a large variety of Unit all-glued laminated rafters. The catalog is fully illustrated and contains complete details for each unit in the line.—UNIT STRUCTURES, Inc., Peshtigo, Wis.

Materials-Handling Grabs. Hooks, tongs, grips, grip slings, piling pullers, and other types of grabs for handling loose bundles, heavy objects, or odd shapes are described in 24-p Bulletin 200B. General information, photographs, and specifications are listed for each type of equipment, as well as construction features, capacity ratings, and safety factors.—DOWNS CRANE & HOISTS CO., 540 W. VERNON AVE., Los Angeles 37, Calif.

Steel Water Lines. Third annual report on pipe-line construction details on principal steel water lines laid by Dresser during the past year. The report gives job details for each line, and contains information on latest developments and wartime conservation methods and materials.—DRESSER MFG. DIV., DRESSER INDUSTRIES, Inc., Bradford, Pa.

Steam Cleaners. Operation and maintenance of steam cleaners is listed in a 6-p booklet. The booklet contains general information on steam cleaners, and a simple schematic diagram to illustrate its operating principles. A feature of the booklet is a list of possible causes of and easy build-up which enables steam-cleaner users to circumvent these troubles.—VAPORS OF DETROIT, 1120 W. Front St., Cincinnati 3, Ohio.

Paver Used for Buildings. "How Would You Do These Jobs?" is the title of a catalog describing the use of the Multifoot paver with High

(Continued on next page)

"Service when you want it!"

...that's only one of the things we mean by Service Plus!

• Once in a while, a customer finds himself short of an essential piece of steel or equipment. That means delay, perhaps layoffs, if the item is not delivered immediately. And that is when Service Plus gets a severe test.

We're glad we have passed these important tests. Some customers have commented: "I like your prompt service." "You have fast and competent service." We hope our customers never find reason to change these opinions.

Service Plus means more than speed. It also means we have in stock a wide range of steels in a variety of shapes and sizes, and we are ready to give courteous, efficient attention to your particular steel supply problem.

BARS · PLATES · FLOOR PLATE · STRUCTURALS · SHEETS · STRIP
REINFORCING BARS · STAINLESS · ALLOY STEELS · ALUMINUM
TOOLS · EQUIPMENT · MACHINERY

WHEN YOU DEAL WITH US, YOU GET Service Plus!

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ENGINEERING NEWS-RECORD

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Litt boom as a complete mixing and pouring tool for building construction. The catalog shows how the 25-ft clearance under the bucket permits all-around use of the paver for pouring concrete directly to forms or concrete buggies on the structure or on the one-story wall. The catalog contains many photographs showing actual jobs in which the paver has been used in this manner.—THE FOOTE CO., INC., SUBS. OF BLAW-KNOX CO., NUNDA, N. Y.

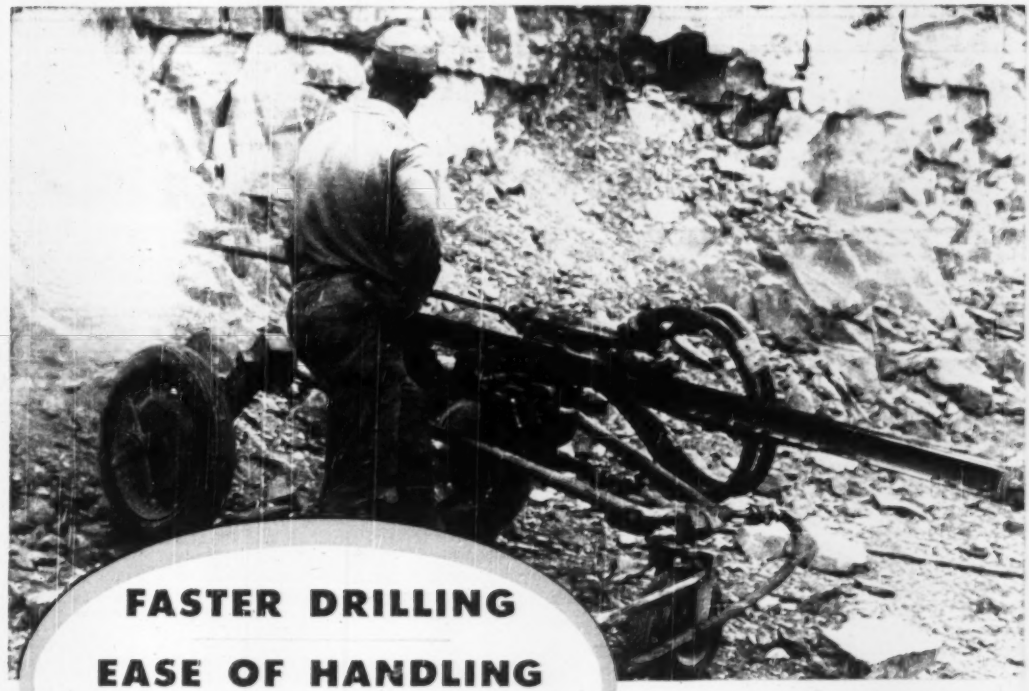
Steeltex Building Materials—Selected data sheets describe Pittsburgh Steeltex building materials and contain directions for specific applications. Pittsburgh reinforcing products are divided into two general classifications: Steeltex, a steel wire mesh with an integral fibrous backing, and Welded Wire Reinforcement, a steel wire mesh without the backing. Catalog DS-152 contains complete information for application and handling of both products.—PITTSBURGH STEEL PRODUCTS CO., GRANT BLDG., PITTSBURGH, PA.

Universal Testing Machine—Low-cost universal testing machine has a range of 60,000 lb. A 4-p folder describing the Sonntag unit lists several design features as well as a complete list of specifications. A line drawing indicates location of important component parts.—THE BALDWIN LOCOMOTIVE WORKS, TESTING EQUIPMENT DEPT., PHILADELPHIA 42, PA.

Variable Weight Rollers—Feature of this catalog (16 ppr.) is a "How to Buy—How to Use" section showing how to select the right roller model for the job. Each new model roller is treated separately with matching illustrations to demonstrate its versatility and limitations. Models listed range in working weights to 12 tons. Considerable space is devoted to a nontechnical discussion of the 4-speed transmission. The catalog is designed as a source book of roller reference material on used equipment, especially as it relates to 3-wheel rollers.—THE BUFFALO-SPRINGFIELD ROLLER CO., SPRINGFIELD, OHIO.

Street and Highway Signs—Complete information on Cataphote's line of traffic signs, street name signs, danger beacons, and reflector buttons is included in Catalog 50-54 ppr. Special feature of the catalog is a listing of standard traffic signs as designated and specified by the Public Roads Administration. Illustrations are provided for typical signs in each group produced by the company.—CATAPHOTE CORP., 958 WALL, TOLEDO, OHIO.

JOY ONE-MAN LIGHTWEIGHT WAGON DRILL



FASTER DRILLING

EASE OF HANDLING

LOW MAINTENANCE

You'll get *more hole* per shift, at lower costs, with the *exclusive* "drill and blow" feature of the JOY Lightweight Wagon Drill. And it's really lightweight—only 750 lbs.—easily operated by one man. Mounts JOY 55 or 65-pound smkers, and 3" or 3½" drifters, as needed . . . requires no spikes due to the positive locked brakes. JOY pioneered the Lightweight eight years ago—more than 500 now in operation. It can save you time and money—*write for bulletin.*

Above, drilling toe-holes—no need to stop drilling to blow. Piston speed and blow automatically adjusted to give fast, consistent and economical drilling in every kind of formation—especially in overburden, clay seams and other material that varies from hard to soft.

Consult a Joy Engineer

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

TVA Reflects the Valley's Growth

TVA's present program is its biggest ever, both in dollars and kilowatts. And as TVA goes, so goes the Tennessee Valley.

Construction activity now is not so intense as in '42. Then, a force of over 27,000 had 12 projects under way at once, and outstanding feats of speed—like the building of 200-ft high Douglas Dam in 15 months—were recorded.

Today's pace is slower, steadier. The total engineering and construction payroll is near 7,000. And things have settled down to normal.

But, it's not the normal anyone anticipated. Nobody foresaw what has taken place since the war. TVA expected a lull at the end of hostilities; its total force was cut back to about 5,000, and much of hot-to-much construction plant was unloaded.

The lull never happened. Industries in the valley were quick to switch from wartime to peacetime production; new industries came in while municipal and rural demand mounted. And, the A-bomb was there to stay.

The valley's power demand now grows faster than 15 percent per year, substantially faster than the U. S. average.

So, now TVA is spending more money on more power than ever before, doing two things: filling its empty cells and tearing its hydroelectric output.

The empty stalls are spaces provided originally at existing hydroelectric plants for future units. By the end of this year, only five empty stalls remain.

• Change in emphasis In tuning its system, TVA has set what is probably the outstanding trend of its present program: heavy emphasis on steam-electric generation. The authority's power people in Chattanooga claim this move to fuel-plant generation is a "must" if the system is to operate effectively. At present, there is an unfavorable imbalance: they claim last year about 85 percent of the production was hydro-power only 15 percent steam. So much hydro in the system means much second-rate power which can't be marketed 100 percent of the time and thus must be sold at a lower rate. Steam plants will increase primary output.

Power engineers also point out that the system's present center of gravity is upstream in its mountainous eastern end, where the hydro plants are concentrated. Transmission of the output westward costs money. They'd like new capacity added downstream—in steam.

TVA already established in the steam power business. In asking funds for four units to put out 500,000 kw at the Johnsonville plant, now under construction, the authority put itself on record with Congress that this was just one of many such requests to come. A fifth and sixth unit have since been asked for Johnsonville. And authorization came from Congress less than two months ago for two 125,000-kw steam units at the newest plant, Widows Creek, in Alabama's northeast corner. Construction began immediately.

It's the emphasis on steam and not steam itself that is new to TVA. There are several relatively small steam plants in the system that have been acquired through the years, and TVA built Watts Bar steam plant during the war to supplement hydro output.

• Dams planned Despite the very definite trend toward fuel plants, TVA is not through with river development. Indeed, it has just started on the Clinch River tributaries above Norris Dam. There are many sites considered for further flood control in the basin and adding power capacity. In the Upper Holston area of northeast Tennessee, Watauga Dam is finished and South Holston will be done by the first next year. Two more projects are planned for the Holston River: the $22,500,000 Boone and $15,000,000 Fort Henry dams. Boone would be near the confluence of the Holston and Watauga rivers; Fort Henry, farther downstream. Congress has been asked to authorize these.

TVA now has 11,500,000 acre-ft of space for flood control. Each reservoir's operation is governed strictly by a "rule" that fixes its level for safety from floods. This curve is adhered to despite loss of power.

• River traffic Navigation on the 650-mile main river to Knoxville hit 470 million ton-miles last year—fifteen times what it was before TVA and still growing.

Knoxville now receives 40 percent of its gasoline supply by water before 1940 no river shipments were handled. Guntersville, Ala., has become an automobile distribution point. Steel in increasing quantities reaches Chattanooga fabricators by water from the Pittsburgh area.

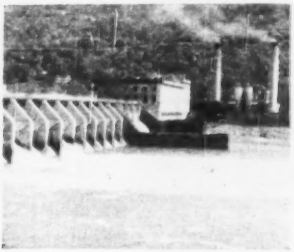
TVA has developed, more or less as a by-product, what may be the area's richest natural resource—recreation. Its dams have formed over 10,000 miles of shoreline, open to private ownership or exploitation by private or governmental (state, county or city) groups. Since the war's end, some $16,000,000 have been invested, and it's only the beginning.

One measure of TVA's growth is impressive now, if not the best one, is its power capacity figures. The spring now 5,000,000 kw installed, 1,300,000 kw under construction and 400,000 kw awaiting congressional approval. By 1953, TVA hopes to have 7,700,000 kw installed—including 400,000 kw from Cumberland River dams now being built by the Corps of Engineers. Of the 5,000,000 kw capacity now available, 2,877,000 kw were generated to meet peak hourly demand last March 2—so hard is demand pressing supply.

One measure of growth of the valley itself is in this comparison. Before TVA, the average income was 40 percent of the national average; it is now 60 percent. There is still room for improvement, and improvement seems inevitable.

But, from here on in, it seems the cause-effect relationship will be more in its proper order. TVA seems destined now to reflect activity in the valley rather than direct it.

TVA dams no desire to extend itself, only to expand with the economy of the area it now serves. And that economy should continue to expand just as long as power—whether it be from water, steam or atom—remains an economic factor.



HALES BAR Dam and steam plant.

profit-wise Contractors buy MICHIGAN ½ yd. Crawler Cranes!

There's no other half-yard crawler crane excavator as good . . . dollar for dollar . . . as the MICHIGAN! Why? Because only MICHIGAN gives you these job-proved, "big-machine" features.

Independent travel to save minutes on every move, hours on every job. Tractor-ease steering to enable faster, easier maneuvering. Automatic, self-locking crawler brakes to give complete safety when working on grades. Smooth fingertip air control to eliminate operator fatigue and that "afternoon let-down."

But, that's not all. There's the oversize internal-tooth circle gear . . . the hook rollers and independent drum assemblies . . . and there are many more. Compare MICHIGAN with any other half-yard crawler crane . . . then you, too, will agree it's your best buy! Take the first step in getting more for your money . . . write, wire or phone for complete details.

MICHIGAN POWER SHOVEL COMPANY

500 Second Street, Benton Harbor, Michigan, U. S. A.

INDEPENDENT TRAVEL — Standard equipment. Crawler mechanism powered through intermediate shafts, forward and reverse gears . . . not through swing gears.

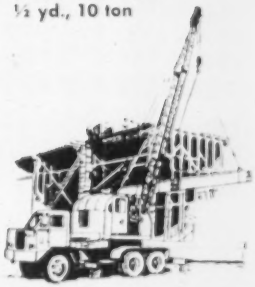
AUTOMATIC-LOCKING BRAKES — Hold crawlers against downhill movement when working on grades. A feature operators appreciate. Brakes lock instantly, are released by air rams.

TRACTOR-EASE STEERING — Operator can maneuver a Michigan accurately and fast because it steers like a tractor . . . steering brakes are used instead of conventional jaw clutches.

FINGERTIP AIR CONTROL — Air pressure to a clutch ram is regulated instantly as operator desires, thus giving him complete control and feel of the load at all times.

Model T6K
¾ yd., 6 ton

Model TMDT-16
½ yd., 10 ton



Model TLDT-20
12 ton

Series 8
½ yd., 8 ton

Model C-16
½ yd., 8 ton

Crushes 125 tons of 1½" rock an hour on TIMKEN bearings

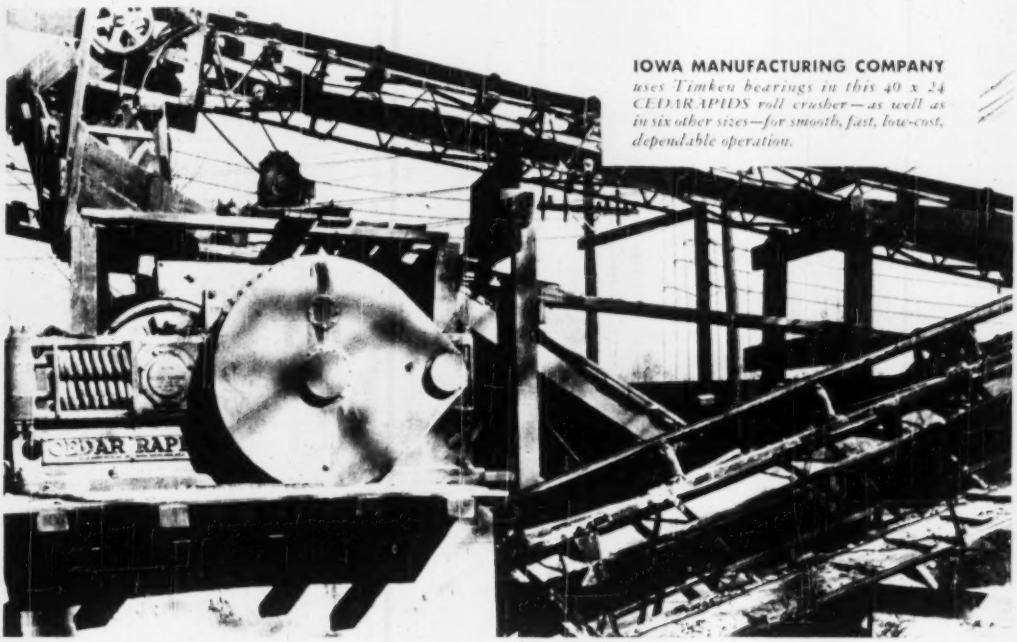
FAST, steady, trouble-free operation is built right into the 40 x 24 CEDARAPIDS roll crusher. With its countershaft mounted on Timken tapered roller bearings, it can take the heavy shock loads day after day without a stop, turn out a large volume of uniform aggregate.

Timken bearings have the advanced tapered design that enables them to carry radial, thrust and combination loads. Line contact between rollers and races gives them tremendous load capacity. Because they're engineered for the job, made of Timken fine alloy steel, and precision-manufactured, they have amazing stamina—normally last the life of the machine.

Timken bearings keep the crusher's shaft in rigid alignment—in spite of the constant pounding—reducing deflection and end-movement. They minimize friction. They cut lubrication time, maintenance costs. They reduce wear on adjacent parts and help prevent breakdowns.

That's why it pays to make sure you have Timken tapered roller bearings on *every* wheel and shaft of *all* your construction equipment. Always look for the trade-mark "Timken" on the bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN BEARING — *The symbol on a product means its bearings are the best.*

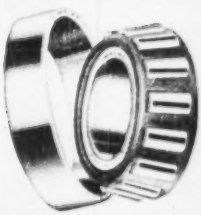


IOWA MANUFACTURING COMPANY *uses Timken bearings in this 40 x 24 CEDARAPIDS roll crusher—as well as in six other sizes—for smooth, fast, low-cost, dependable operation.*

DESIGN LEADERSHIP

The first Timken tapered roller bearings was produced in 1906. Since then the one-piece multiple-perforated cage, wide-area contact between roll ends and ribs, and many other important tapered roller bearing improvements have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1 advanced design, 2 precision manufacture, 3 rigid quality control, 4 special analysis steels.



TAPERED ROLLER BEARINGS

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION